The MINING CONGRESS JOURNAL

In This Issue

What of Minerals and Metals in Australia and New Zealand?

Gold Mining Operations in Northern Virginia

Metal Convention and Exposition at San Francisco

Accident Experience and Cost in Virginia Coal Mines

Costs in Relation to Mining

Homestake Mining Company

Accident Prevention and Safety at Mascot, Tenn.

Some Safety Standards for Metal Mining

Contributors

M. W. von Bernewitz, William M. McGill, Jos. F. Davies, H. B. Humphrey, Carel Robinson, Darell P. Ayer, P. M. Arthur, D. Harrington

OCTOBER

1934

Your Industry

DEMANDS SUPPORT

"I don't believe there has ever been a time when it was of such vital importance for all business groups to cooperate in the study of current problems . . . we should do everything within our power to make constructive proposals effective with the least delay . . . and should cooperate in strenuous objection to destructive ones."

Howard I. Young, President,
American Zinc, Lead, and Smelting Co.

A few men or a few companies cannot, by individual appeal, force a great government to listen to those proposed changes *they* desire or wish rejected. But the government can be reached through NUMBERS . . . IMMEDIATELY!

You realize the pertinent need for action today on many government proposals affecting you, yourself. We are asking your support in making NUMBERS so that we, in turn, can do a more effective work for the industry. The industry must have NUMBERS! Take advantage of our new "$15.00 courtesy suspension" offer. LEND YOUR SUPPORT AND HELP TO THE INDUSTRY NOW. MAIL YOUR CHECK TODAY!

▲

Short Time Offer in Statement

$10.00

▼

The American Mining Congress

WASHINGTON, D. C.
MUNSEY BUILDING

. . . modern Coal Preparation requires . .

Modern Tipples
Remodeling Existing Tipples
Crusher Installations
Screening and Mixing Plants
Coal Washeries—Types to Suit Your Requiremets
Coal Cleaning by Air Process
Combination Wet and Dry Cleaning Plants
Dedusting Plants
Revolving Dumps
Car Feeders

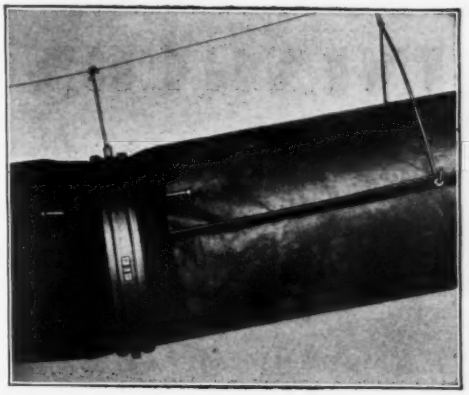
Whatever your preparation needs may be, our engineers can find the proper answer. We invite you to make liberal use of our consulting service and Test Laboratory.

Roberts and Schaefer Co.

ENGINEERS *and* CONTRACTORS

1110 Wrigley Bldg. CHICAGO, ILL.

3883 Beachwood Blvd. PITTSBURGH, PA. | 514 Ninth Avenue HUNTINGTON, W. VA. | P. O. Box 55 DENVER, COLO.



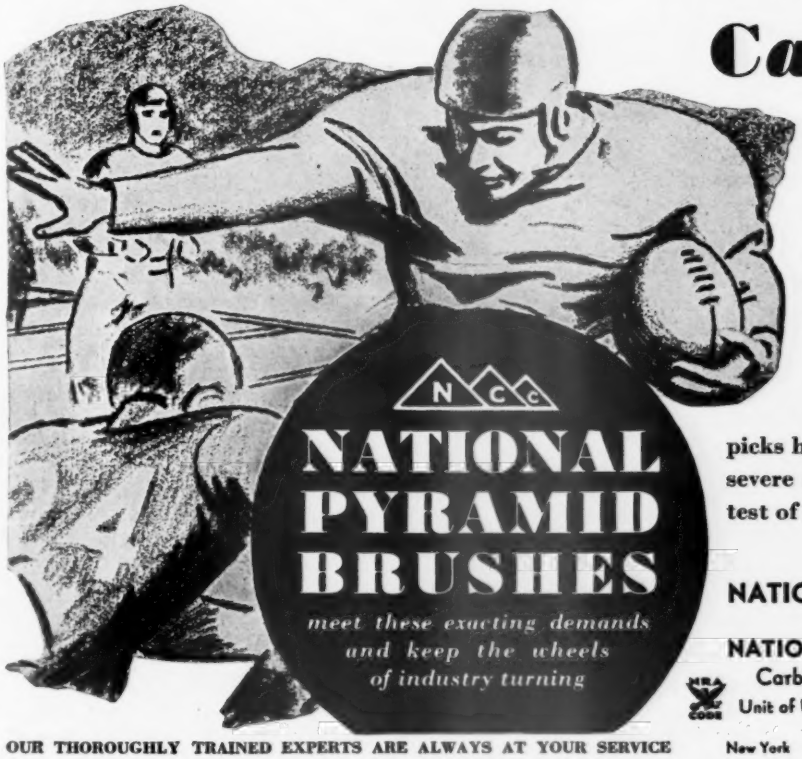
"MINE-VENT" Flexible Blower Pipe with patented demountable Couplings

Latest improvements in Flexible Blower Tubing.
Eliminates Waste—Utilizes Short Tubing Lengths
Couplings demountable, not sewed in end of Tubing
Most practical for vertical or horizontal position
Acid and Fungus resisting Fabrics

Western Agents
H. J. HERSEY & CO.
1743 First Avenue, South Seattle
Dooly Block Salt Lake City

Made by
AMERICAN BRATTICE CLOTH CO.
WARSAW, INDIANA

When Coaches Choose Candidates



WEIGHT, strength and speed influence the selection of the team from a large squad of candidates, but performance in the game is the final test.

National Pyramid Brushes are selected for specific applications as carefully as the coach picks his team. Performance under the severe demands of service is the final test of quality.

CHOOSE NATIONAL PYRAMID BRUSHES

NATIONAL CARBON COMPANY, INC.
Carbon Sales Division, Cleveland, Ohio
Unit of Union Carbide UCC and Carbon Corporation
Branch Sales Offices
New York - Pittsburgh - Chicago - San Francisco

OUR THOROUGHLY TRAINED EXPERTS ARE ALWAYS AT YOUR SERVICE

The MINING CONGRESS JOURNAL

OCTOBER 1934 — NUMBER 10 VOLUME 20

HUMAN RIGHTS and PROPERTY RIGHTS 5

EDITORIALS 8

WHAT OF MINERALS and METALS in AUSTRALIA and NEW ZEALAND ... 9
by M. W. von Bernewitz

GOLD MINING OPERATIONS in NORTHERN VIRGINIA 12
by William M. McGill

WHEELS OF GOVERNMENT 17

BUREAU OF MINES COMMITTEE ACTIVITIES 19

METAL CONVENTION and EXPOSITION 20

ACCIDENT EXPERIENCE and COST in VIRGINIA COAL MINES 22
by Jos. F. Davies and H. B. Humphrey

COSTS IN RELATION TO MINING 24
by Carel Robinson

HOMESTAKE MINING COMPANY—Ellison Shaft 25
by Darell P. Ayer

ACCIDENT PREVENTION and SAFETY at MASCOTT, TENN 27
by P. M. Arthur

SOME SAFETY STANDARDS FOR METAL MINING 29
by D. Harrington

MINING EVENTS 31

PERSONALS 39

HAVE YOU HEARD? 40

NEWS OF MANUFACTURERS 41

E. R. COOMBES
Editor

G. B. SOUTHWARD
Associate Editor

F. W. MORAN
Field Representative

Published every month by The American Mining Congress, Washington, D. C. Edited under the supervision of James F. Callbreath, Secretary of The American Mining Congress. Copyright 1933 by The American Mining Congress, Munsey Bldg., Washington, D. C. Entered as Second Class Mail Matter January 30, 1915, at the Post Office at Washington, D. C. Published 12 times annually—the first of each month. Yearly subscription, United States and Canada, $3.00; Foreign, $4.00; single copies, $0.30.

Human Rights And Property Rights

PERSONAL LIBERTY reigned supreme in the Garden of Eden.

Personal property had not then been segregated, except as to the forbidden fruit upon the tree of knowledge.

Notwithstanding the almost universal ownership in all the then existing property, Eve plucked and Adam received of the forbidden fruit and brought upon the human race the curse:

"In sorrow shalt thou eat of it all the days of thy life," and "In the sweat of thy face shalt thou eat bread."

Personal liberty and private property were then inseparately linked together and neither has or can exist without the other.

As personal property increased in the hands of the prudent and the industrious, the less prudent and the less industrious sought to take from the prudent in order to give to others, who tried to evade the effect of Eden's curse upon those who sought the forbidden fruit, the property of another.

Personal liberty is of no value except as it is associated with private property.

Capital is but stored up labor, the result of industry and prudence. Without capital in large amounts, either individually owned or owned by many individuals associated together in the form of incorporated bodies, there could be no cross-continent railroads; there could be no large employment; there could be no mass production.

Accumulated capital is of no value to its owners, except to be used, directly or indirectly, in the payment of wages through which profits are created, which can be so divided as to leave an earning for the capital so invested.

If it thus earns for its owner, who risks its investment, it must, at the same time, provide employment. When this profit inducement is absent, capital remains idle, employment is at an end, and business depression prevails.

It is somewhat amusing to have the executive head of our Government thoroughly approving an organized effort looking to the preservation of constitutional government, and at the same time urging that the Constitution, while providing complete recognition of property rights, does not seem to give proper consideration to human rights.

From the standpoint of humanity, every individual comes into the world with exactly the same right as every other individual. According to the Declaration of Independence, all men are created equal.

This does not mean that each has the same endowment as all others, because natural endowment varies and, so far as ascertainable, is never twice alike.

Under barbaric conditions the right to possess an acquired article and to defend that possession was accepted as a natural law. As these possessions increased it was found that organized society must be created to protect those rights in property which could not be possessed and transported.

Gradually civilization grew out of the necessity of protecting the rights of personal liberty and personal property, and the human rights, the defense of which was then limited to the physical strength and skill of the defender. The organizations, tribal or otherwise, necessary to protect these gradually acquired rights grew in form and complexity into the organizations of the present day, which now protect, as far as may be, through executive powers made effective by the decision of courts based upon laws made by the representatives of the people.

During the many years of growing civilization, property rights and personal liberty have been practically the same thing. The right of a human being includes the right to complete protection of his personal property from trespass or interference by any other human being.

To say that any human being has a right to appropriate property created by a fellow man, in the production of which he has had no part, is to create a new right.

The counterpart of that doctrine is that all property rights must cease and each individual would have the right to take whatever he finds and appropriate the same to his own use until a stronger man took it from him.

Personal rights and property rights, in practical application, are one and the same thing.

It is usual for an American citizen to believe that the civil government of the United States is the most perfect of any government in the world, in that it provides constitutional protection to the rights of individuals, which rights are defined by law.

In these days we have developed a tendency to sympathize with lawbreakers, to lionize highwaymen, and to carry flowers to criminals who defy the law. Is it not time that our sympathy shall be exercised in behalf of the family of the law-abiding citizen who meets death at the hands of criminals and for those who suffer in consequence of the lawless act of criminals who, instead of creating personal property, prefer taking from him who has devoted his life to those pursuits which are necessary to create his own property rights, as well as to create taxable property for the support of government?

Whenever we find a half-baked political mind which seeks public favor by sympathy with the slovenly, the lazy, and the criminal; whenever we find a man shedding tears of sympathy for lawbreakers and criminals, we shall also find a man who detests all government and who would by pillage, by arson, and by murder exterminate all those forces which the world has created for the protection of human rights, the rights of personal liberty and private property.

New Strength and Stamina-

for present-day demands

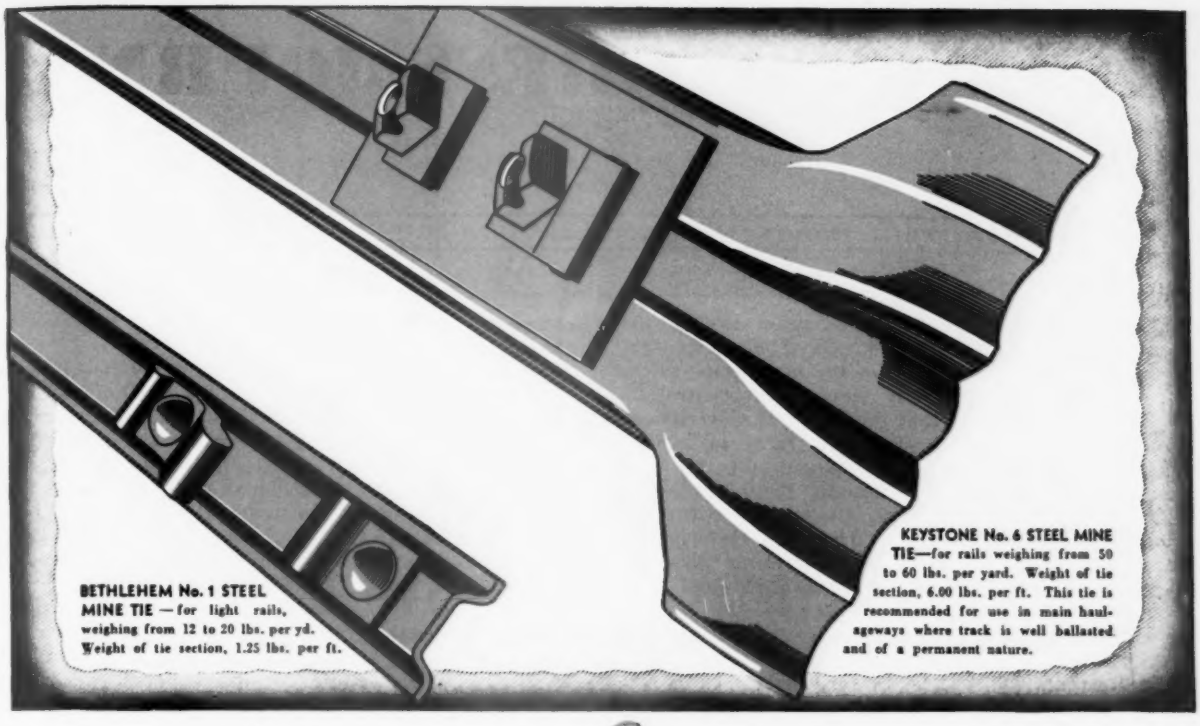
THESE Bethlehem Steel Mine Ties have been given new stamina and rugged strength that enable them to more than measure up to any demands made by present-day mining equipment and methods.

Sections have been given much greater resistance to bending—as much as 93.5 per cent greater in the case of the No. 2 Tie—with no appreciable increase in weight. The rail-fastenings, always an outstandingly strong part of Bethlehem Steel Ties, have been further strengthened, and their bearing area on the rail base substantially increased. No spreading or rolling over of the rails when these ties are used.

Deep, rigid sections provide ample support for heavier equipment. Rugged clips hold the rail in a vise-like grip that the shocks of fast operation cannot loosen. With these ties you can lay track on which traffic will keep moving rapidly and regularly with a minimum of maintenance. They practically eliminate derailments.

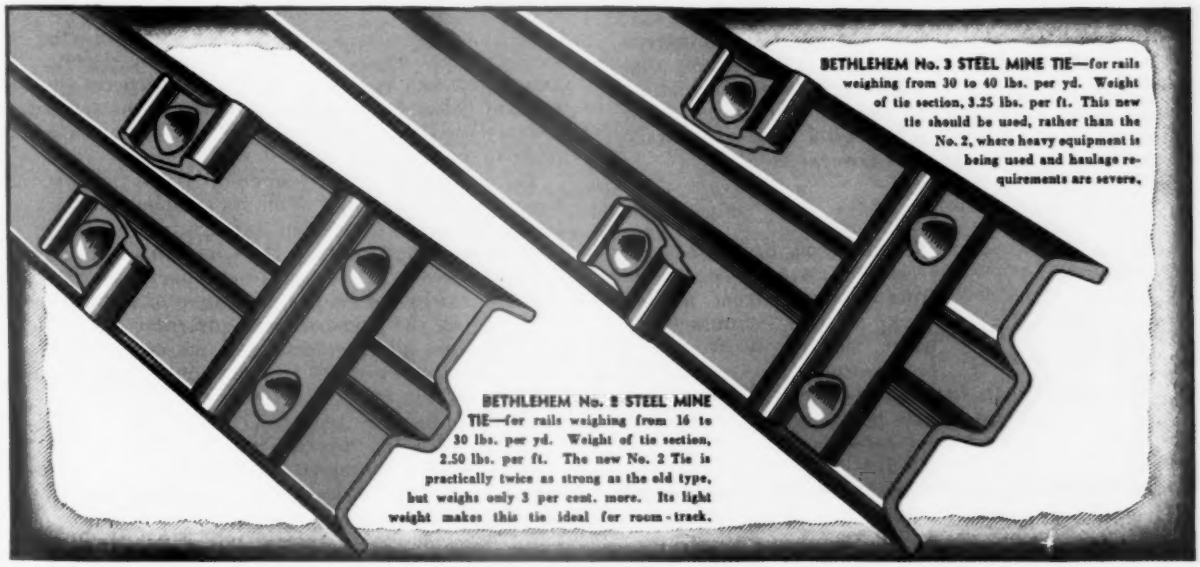
This new series of Bethlehem Steel Ties, painted red for identification, covers the entire range of mine-track requirements from the lightest room-track to that for heavy main haulageways. For each class of service there is a tie that combines light weight that makes for ease of handling with more than ample strength for the job, even under the severe service that is leading to the use of heavier rails in many mines.

BETHLEHEM STEEL


BETHLEHEM No. 1 STEEL MINE TIE — for light rails, weighing from 12 to 20 lbs. per yd. Weight of tie section, 1.25 lbs. per ft.
KEYSTONE No. 6 STEEL MINE TIE—for rails weighing from 50 to 60 lbs. per yard. Weight of tie section, 6.00 lbs. per ft. This tie is recommended for use in main haulageways where track is well ballasted and of a permanent nature.

Bethlehem Steel Mine Ties

PAINTED RED FOR IDENTIFICATION


BETHLEHEM No. 3 STEEL MINE TIE—for rails weighing from 30 to 40 lbs. per yd. Weight of tie section, 3.25 lbs. per ft. This new tie should be used, rather than the No. 2, where heavy equipment is being used and haulage requirements are severe.
BETHLEHEM No. 2 STEEL MINE TIE—for rails weighing from 16 to 30 lbs. per yd. Weight of tie section, 2.50 lbs. per ft. The new No. 2 Tie is practically twice as strong as the old type, but weighs only 3 per cent. more. Its light weight makes this tie ideal for room-track.

BETHLEHEM STEEL COMPANY, GENERAL OFFICES: BETHLEHEM, PA.

District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corporation, San Francisco, Seattle, Los Angeles, Portland and Honolulu. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

The
MINING CONGRESS JOURNAL

VOLUME 20
NUMBER 10

OCTOBER
1934

A Journal for the entire mining industry published by The American Mining Congress

Control and Responsibility

THERE is no dodging the fact that Government management of business means essentially Government control of that business. If Government assumes the right to dictate management, it must also accept responsibility for that management. When it establishes a regulation as to profits or no profits in industry, it is but a step further to nationalizing of business. When the Government announces a policy of erecting meat canning factories in competition with already established business and, through codes and otherwise, prescribes the profits, wages and working hours of the industries with whom they contemplate competition, the path seems fairly plain toward nationalization. So far, Government seems bent upon regulation of business or dictation of business policies, being content to limit profits through taxation and codes.

An Indisputable Fact

THIS is a representative government. It must not become a dictatorship. Representative government has its weaknesses, but it has served our people through many crises and in the main has given satisfaction. As a result, it has left each citizen with a consciousness that his vote was cast and counted for the man he desired to represent him in public life. When we destroy that thought, or that principle, we have destroyed the nation.

Such legislative proposals as the bargaining tariff and the industrial disputes bills go a long way toward breaking down representative government.

States Rights

THE *Wall Street Journal* recently presented an excerpt from a letter from a New York State manufacturer, which, because it presents a real viewpoint, we repeat:

"Centralizing authority with the Federal Government at the expense of state rights is a policy that is undermining our whole system of government. The original plan of a federation of states lies at the bottom of whatever success democracy has reached in the United States. If it was a good plan at the time of its inception, it is of vastly greater value now because the size of the country with its varied local interests and the distances existing between the Federal capital and its remote territories are all against successful attempts to mould the whole nation into one standardized unit."

It is no mean task to govern 125,000,000 people from a centralized point. Alaska, 3,000 miles away from Washington, has been loud in her protests at long-distance government. This territory is an excellent example of what not to do.

Recently a man who should know better advocated that the Government should establish one national bank and license all others; that we should have a centralized police force, eliminating state, county and city officers; that we should abolish counties; and that there should be one tax agency, with money assessed and collected from Washington and redistributed by the same agency on the basis of a state's population or need or something.

Loose and impotent thinking is too prevalent in the United States today. History has been known to repeat itself. Three million square miles of territory represents a vast country. It holds many peoples of many strata of life. A superhuman group in Washington, if obtainable, would fail in centralized control over such a territory and such a mass of humanity. Before we lose our last remnant of commonsense, let us calmly re-read the history of the nations of the world; let us go back to our high school days and review the history of the making of these United States of America; and, above all, let us have a rebirth of that independence of thought and action that actuated our forefathers.

Our Membership In the I. L. O.

THE aims and purposes of the International Labor Organization, in which our President has accepted membership, merit the wholehearted approval of every person. The announced aim is "to bring about a general improvement of debased industrial standards to the end that no country need fear 'unfair competition' from the sweated labor of rival employers."

The organization is 15 years old. It has taken at times hasty action but on the whole its recommendations have been sound. As at present functioning, a year of discussion must now precede the adoption of any convention at Geneva. Thorough preliminary examination is also assured by the tri-partite system of national representation in the organization—governments, employers and labor are all represented. A major purpose of the organization is an effort to secure international limitation of working hours and conditions of working. It is interesting to note that no recommendations of this group have in any way affected the United States, because all of their proposals fall far short of the already established wage scales, hours of work and working standards already in effect here.

No one can really quarrel with any effort with so laudable a purpose. Many confusing questions are likely to arise through our membership in the organization, but on the whole America should lend its moral support to the betterment of world working conditions. When other countries approach our own standards, less difficulty will be experienced in meeting unfair competition.

Federal Parliament House at Canberra, Australia. At present, the capital has 9,000 people, but all departments have not been transferred there. It has been laid out for ten times that population in a great basin at an altitude of 1,900 feet. The Commonwealth Government is helping the mineral industries by loaning money, giving bounties and bonuses, making geophysical surveys, and cooperating with the states.

What of Minerals and Metals in Australia and New Zealand?

By M. W. von BERNEWITZ *

HOW ARE conditions in Australia and New Zealand is a question that the writer has been frequently asked since his return from those Dominions. A generally suitable answer is that, as in the United States, there has been a great improvement in industry and business, and it continues with more or less hesitation. The recession in business in those countries started before it did here, and they used other methods of recovery; also at great cost in taxation and in relief work.

Because credit was so low in London, Australia and New Zealand had to pay £130 for £100; now it is £125, and there is a desire to reduce or eliminate this exchange as their credit shows a large balance. This 25 percent exchange has been profitable to some businesses, but a weight on the majority of the people, although the Governments consider that it is of much benefit. Legal complications resulted also. Several issues of $100 Australian bonds in New York declined to $30, but they are now above $90, showing how conditions—politically and industrially—have improved and confidence restored.

There is rather too much politics in the Commonwealth of Australia and the Dominion of New Zealand; the party is practically everything, the issue is secondary. Both countries are saddled with enormous debts for populations of six and three-fourths millions and one and three-fourths millions of people, respectively. Half has been for development and half for the World War. But borrowing continues, internally in Australia for the Federal Government and externally for the six state governments and New Zealand. Australia and New Zealand are rich in many resources, but as they produce greatly more than the people consume, the remainder must be exported, and therefore exports are of great importance. But these products must be shipped 9,000 to 14,000 miles to their markets, and in these days of each nation trying to be self-sufficient, Australia and New Zealand are worried about disposing of their surplus special produce—butter and other dairy products, fruit, meat, metals and minerals, rabbit skins, sugar, wheat, and wool.

One of the "pyramids" of Kalgoorlie, a residue dump of a million tons at the Great Boulder gold mine. It surrounds the headframe of one of the shafts. Clear water is running down to be reused. A fine example of the shoveler's art.

There have been heavy carry-overs from season to season, like the copper, cotton, and wheat in the United States; coffee in Brazil; rice in Siam; and sugar in Cuba. Export of perishable products calls for many ships scientifically ventilated and cooled to different temperatures, the latest being the chilling (just above freezing) of meat in an atmosphere with 10 percent carbon dioxide. Boston may be the wool center of United States, but it is small compared to the movement, selling, and shipping of wool in Sydney.

As London and New York determine metal prices, Australia has to accept them and depend on the demand from England, Europe, and the Orient to sell its surplus copper, lead, silver, tin, and zinc.

Australian and New Zealand technical and business control of mines and works is equal to any. A quiet keenness and thoroughness are noticeable. As to the workmen, they are adaptable and fairly efficient, but the average man's thoughts seem to be wages and politics. Labor has been in power from time to time and has passed many laws which, when they react adversely, the men will not abide by them. Union regulations are extreme. Discharge of a unionist is very likely to shut down a mine or works, and at the present time the writer knows of several recovering from a lengthy walk out and of others shut down because managers dared discharge men for breaking rules. An

* The writer, formerly with the "Mining and Scientific Press" and United States Bureau of Mines, worked in both countries for 15 years, and after an absence of 21 years in the United States meanwhile keeping in close touch with conditions over here, recently spent 10 months in the Commonwealth and Dominion.

amusing labor item may be told here: In April of this year, several hundred men receiving relief pay in Sydney downed tools demanding morning tea at 10.30 o'clock and time off to drink it! The writer's wife remarked, "Fancy strong men striking for their tea."

The Mineral Industries

Although minerals in every country are a basic resource, and Governments do not treat their mining departments and bureaus with the consideration given agriculture, in Australia and New Zealand they are among the "secondary" industries. True, the annual output there is fractional when compared with that of the products of the soil mentioned, but minerals are primary. However, they may be briefly reviewed as follows, based on the places visited by the writer and his general knowledge:

Cement-Making Materials.—Australia and New Zealand make all the cement they need. It is of high quality. At Portland, North Island of New Zealand, the Wilsons (N. Z.) Portland Cement Company makes 600 tons a day and pays 10 percent dividends. It has large deposits of argillaceous clay and limestone, which are quarried; a coal mine which lies under this lime deposit and makes much water, hydro-electric power; a well-planned village; land on which thousands of company sheep feed; a mill in which cement may be made wet or dry, and transportation by rail or steamer. Railway workers will handle returned sacks but shipping workers will not! The gypsum used comes from South Australia. All operations are under chemical control.

In Sydney, Australia, a large plant makes the Bates multi-wall paper cement bag under license of an Australian patent. The High Court there, equivalent to the Supreme Court here, recently squashed an Australian firm that was infringing the Bates patent.

Coal.—Australia has coal for centuries, the ranks being brown, lignite, and bituminous. The last mentioned approximates Pittsburgh coal. New Zealand has plenty for many years of lignite, sub-bituminous, bituminous, and a little semi-anthracite. For blending, that Dominion imports some Newcastle, New South Wales, coal. Research in coal is being done by the New Zealand, New South Wales, and Victorian Governments and by the Australian Gas Light Company in Sydney.

In New Zealand, which uses 2,000,000 tons a year, one problem is utilizing slack produced in mining the semi-bituminous coal. The writer visited a Lurgi carbonization - briquetting plant near Huntly, center of coal mining in the North Island. A well-built German equipment, but financially and somewhat technically not successful. The briquets burn well, but they are too expensive to compete with coal. In that district are several well-equipped mines. One, the Glen Alton, has a daily capacity of 2,000 tons, and uniquely, it supplies slack coal to 30 butter and cheese factories of the New Zealand Cooperative Dairy Company, which draws its supply of cream from 400,000 cows, scattered, of course, over many square miles of country. The mine is a drift operation, in thick coal, up to 14 ft., and has ground-rope haulage throughout. This is common practice in New Zealand and costs as low as 4 cents per ton. Accident prevention is prominent. A well situated and tended village is a feature.

In Australia, the coal port of Newcastle was visited, but no mines. That district is suffering from a decline in business, partly due to frequent labor troubles and to inroads of imported oils. Several million tons of trade have been lost. At Yallourn," State of Victoria, the writer visited the counterpart of the brown-coal operations in Germany. The only difference is in the high moisture content, 65 percent. The Government has spent more than $50,000,000 in developing a great open pit 190 ft. deep and producing 9,000 tons a day, a 100,000-kilowatt power plant, and a briquetting works to make 1,500 tons a day. Eventually this enterprise is to supply the whole state of 88,000 square miles with power and fuel. The briquets are good and cheap. The burning of coal with 65 percent moisture is of much interest. It is pre-dried by waste heat from the boilers and then burned on step-grates. The village of Yallourn, which is aboriginal (not "bushman" as erroneously termed in United States), for "brown fire" is a picture. The project is technically and financially a great success.

Four states and the Dominion have Government-owned mines, with a good share of labor troubles—New South Wales, Queensland, New Zealand, bituminous; Victoria, sub-bituminous; Western Australia, lignite.

Fertilizers.—In agricultural regions such as Australia and New Zealand, great quantities of fertilizers are necessary to replenish the much-used soil. These countries make practically all they need, excepting special manures as basic slag, potash, and nitrates, which are imported from England, Europe, and Chile. Superphosphates are the principal fertilizer manufactured. The phosphate rock comes in ships carrying 8,000 tons from Nauru and Ocean Islands, western Pacific Ocean. These are mandated islands under the League of Nations and contain more than 100,000,000 tons. Sulphuric acid in Australia is made from pyrite from the Mount Lyell copper mine in Tasmania, and from sulphur from Texas and Japan. New Zealand uses sulphur. Exchange rates have switched some business from United States to Japan. Near Auckland, a beautiful city of 220,000 in New Zealand, the writer visited the New Zealand Farmers' Fertilizer Company works. They can make 80,000 tons a year, also several by-products valuable as sprays, weed-killers, and prevention of "rust" in wheat. Chemically controlled, research studies, good management, and a big market make this a profitable concern.

Pumping Station at the largest of two reservoirs for the Broken Hill mines and town, which are ten miles distant

Copper.—The current main source of Australian copper is Mount Lyell, in the island State of Tasmania. It is famous mineralogically, metallurgically, and financially. Favored with low to high grade ores in its group of mines, now having reserves of more than 2,000,000 tons, and never backward in technical advance, and taking advantage of the manufacture of by-products as acid and fertilizers, the company is a good example of how to do things. Years ago the writer saw pyrite smelting at its prime, practically no coke being used in the blast furnaces, as tried at Anaconda, Mont., and Copperhill, Tenn. Now, the ore is concentrated by flotation at the rate of 1,500 tons a day assaying 2¼ to 5 percent copper. Concentrates are smelted locally.

Another source of copper, a by-product from gold, is Mount Morgan, Queensland. Another famous mine that paid millions in dividends, but not until recent years as metallurgically sound as Mount Lyell, and having bad treatment by the labor union which actually caused its abandonment, although 6,000,000 tons of ore remained! In 1932 the Commonwealth Government loaned a new company $72,000 to renew operations, and at the present time the flotation plant is handling 500 tons a day of ore averaging 6½ pennyweight gold and about 1 percent copper. This is mined by open cut where 600,000 tons are available for the enlarged mill of 850

tons a day, and ten times that quantity of less grade for underground methods. Dividends are being paid. Concentrates are sent to Port Kembla, New South Wales, where the Electrolytic Smelting and Refining Company has a smelter and refinery.

Australia has produced 22,000 tons of copper in a year, but the rate is now 10,000 tons, approximately the consumption. Copper works make sheet, wire, rods, and extruded metal. New Zealand is copperless.

Gold and Silver.—So much to say in so little space: To get rid of silver we may write that there are no straight silver ores in Australia or New Zealand. The white metal occurs with gold ores in small quantity as in Victoria, to many ounces per ton as in New Guinea, with copper ores upward of ½ ounce per ton as in Mount Lyell ore, and with lead and zinc as 5 ounces per ton at Mount Isa to double that average at Broken Hill. Australia averages around 10,000,000 ounces a year, say 5 percent of the world output. Australia has had its own silver currency many years; New Zealand and Fiji recently issued their own for the first time, the coins being characteristic.

Thirty years ago, Australia jostled United States for second place in world gold production. Both went to a "low" in 1929, with Australia a quarter of United States, itself only half of what it was. Now, on a fine-gold basis, the Commonwealth, Dominion of New Zealand, and Territory of New Guinea are not booming, but they are flushed with increasing metal output, premiums, and dividends. Four-dollar ore is now worth $8, and profitable. Thousands of prospectors (many of them on state aid) and miners are in new and old districts—desert and agricultural country. Some new finds; old prospects reopened; run-down mines redeveloped, reequipped and regrouped; dredging revived; employment at high wages given to many; engineers, geologists, and geophysicts busy in motor cars, motor trucks, and airplanes. Australia's gold output doubled since 1929, including Queensland's gain of ten times; New Zealand's yield steadily gaining; New Guinea's production fast growing, and many shareholders receiving dividends and watching their market advancing. Gold has meant much to Australia ever since its discovery in quantity in 1852—three and one-fourth billion dollars of it. New Zealand has exported $460,000,000 worth because it hasn't any mint; Australia has two mints, formerly three.

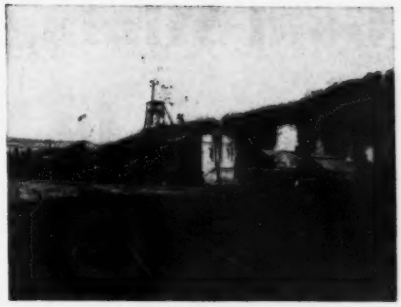
In New Zealand the writer visited the famous Waihi (Y-he) gold-silver mine. Still going lustily after yielding nearly 9,000,000 tons of ore and paying $29,000,000 in dividends. . . . On to Western Australia, a cross-country train ride equivalent to New York to Salt Lake City, brought me to Kalgoorlie, whose gold output exceeds that of Cripple Creek. The revival there has been exceptional. Mining is to a depth of 3,600 ft. and metallurgy of the sulpho-telluride ore is either flotation and cyanidation of concentrate only or bromocyaniding all the ore, or roasting and cyaniding all the ore. Reserves total 4,000,000 tons, 80,000 tons a month being mined. Kalgoorlie is hot and dusty, but it has every convenience, including cheap power and water that comes 353 miles. The whole state is benefitting from gold again because farming is not too profitable now.

Gold and airplanes are developing one of the last outposts in the world—New Guinea. Australian prospectors faced jungle, high mountains, torrents, and savages, and found gold in quantity. Australian aviators paved the way, literally speaking, to the interior with loads weighing up to 7,000 pounds apiece. Australian engineers, with some Americans, have developed dredging areas and ore deposits, until the present (June, 1934) monthly bullion output is 26,000 ounces. Dependence (and sure it is) is on airplanes in New Guinea; roads may never be constructed. They also fly over Papua, the southeastern port of the island of New Guinea, also

Surface Plant of the Zinc Corporation, Broken Hill

a gold producer. There is no lack of mining and metallurgical problems.

Iron and Steel.—Australia has much iron ore and two extensive blast furnace and steel works in New South Wales—at Port Kembla, an industrial center two hours south of Sydney, the Australian Iron and Steel Company operates; and at Newcastle, a coal and industrial center, three hours north, the Broken Hill Proprietary employs more than 3,000 men. The writer visited the latter and imagined that he was in Pittsburgh when he saw the blast furnaces and rolling mills and engines bearing well-known makers' names. Ore for the new Port Kembla works, which makes iron, plate, sheet, and pipe, comes 150 miles by rail from a deposit west of Bathurst, on a plateau beyond the Blue Mountains. Ore for Newcastle comes 1,400 miles by sea from a deposit in South Australia and is discharged at furnaces at around $2.50 a ton. Many millions of tons average 65 percent iron. The B. H. P., as this operator is known, owns this deposit and ore boats, coal mines and coke works near Newcastle, and makes anything of steel, including 90-pound rails. It supplies sheet to a near-by independent pipe works and to a zinc-coating plant, and it is building



New South Wales Government Coal Mine, Lithgow. Daily output 1,500 tons, only for the railways

a tin-plating plant. The B. H. P. works can make more than 300,000 tons of steel a year and pay dividends. Two features of this well-managed mill are the shadow method of placing tools of all sizes on the walls and a shed for housing a thousand or more bicycles ridden by men who cannot afford motor cars. Originally, the Broken Hill Proprietary operated on a large scale at Broken Hill and was a pioneer in the flotation of lead-silver-zinc ores. It mined millions of tons and millions in dividends. Now its efforts are centered on steel, and on the side some gold mining; from "Silver to Steel," the title of a book published by the company years ago. A splendid enterprise, with Australia at heart.

The State of Western Australia has considerable good iron ore in the northwest, but transportation is too expensive and this is a reserve for the future.

New Zealand has ore in the South Island and iron-bearing sand on its west coast, but as pig can be imported cheaply, attempts at reducing the ore have not been profitable.

A word on governmental bonuses for industry: From 1909 to 1917 the Commonwealth Government paid a bonus of $3 down to $2 a ton on all pig iron and steel manufactured from Australian ores. This bonus materially assisted in establishing the industry, more especially in its initial stages when imports gave keen competition. . . . For years this Government offered a bounty on the extraction of oil from shale, but it did not establish an industry. . . . The bonus paid on gold during 1930 and 1931 did help a dying industry, and this bonus, giving way to the present high premiums, resulted in one that is flourishing.

Lead and Zinc.—Silver's connection with lead and zinc has been reviewed. Australia produces 10 to 12 percent of world lead and 10 to 15 percent of world zinc. Although there are small to fairly large deposits in Western Australia and Tasmania, the four mines at Broken Hill, New South Wales, and one mine at Mount Isa, Queensland, are the main sources of these metals. At present, Mount Isa is only a lead-silver producer, but it has much zinc ore. At Port Pirie, South Australia, is one of the world's largest and best appointed lead smelters and refineries, and at Risdon, Tasmania, is the third largest electrolytic zinc

(*Concluded on page* 37)

Gold Mining Operations in Northern Virginia

By WILLIAM M. McGILL *

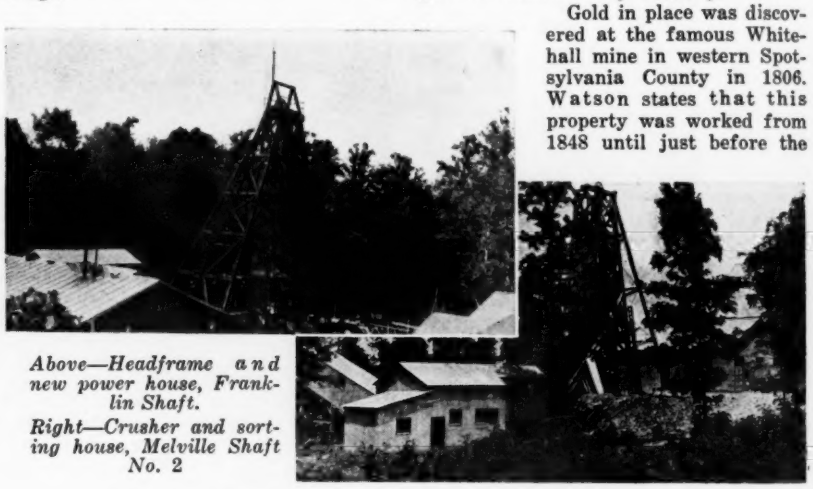
THE recent renewal of exploration and development operations in several localities in the gold-bearing region of Virginia has not only aroused widespread interest in such activities but has naturally promoted speculation as to the probable development or discovery of deposits of "the precious yellow metal" of commercial importance in the "Old Dominion." Considerable importance therefore attaches to the results of explorations now in progress and to the probable extension of prospecting operations or the "further search of gold" throughout the greater part, if not all of, the former producing areas in the Piedmont region.

The progress already reported by a few of the more extensive explorations is sufficiently encouraging to indicate the possibility of the occurrence of deposits of low-grade, gold-bearing sulphides of sufficient extent which by deep mining or through careful scientific exploitation and by the use of modern milling and recovery methods, may be successfully developed into profitable gold mines.

Distribution

The old axiom, "Gold is where you find it," is as true today as when Whitehall mine was discovered in 1806. However, gold does not occur accidentally but only where and when favorable geological conditions exist or have existed. A study of the known mines and mining districts and detailed investigations of the character and type of rocks in which gold occurs prove this. Therefore, a knowledge of the type or kind of rocks in which gold occurs, the nature or manner of its occurrence and the proved extent or limitations of known ore bodies are essential to the prospector or operator in the discovery or development of a profitable gold mine.

The principal gold deposits of Virginia occur east of the Blue Ridge Mountains in a belt of crystalline rocks extending southwesterly across the state from the Potomac River on the north to and beyond the North Carolina line on the south. The belt ranges in width from 12 to 25 miles and is about 240 miles in length, embracing an area of some 4,000 square miles. Its best developed portion is in Fauquier, Stafford, Culpeper, Orange, Spotsylvania, Louisa, Fluvanna, Goochland and Buckingham counties. Gold also occurs in Appomattox, Prince Edward, Pittsylvania, Charlotte, Halifax and Franklin counties in the southwest portion of the main belt, and small areas of gold bearing rocks are known in Montgomery and Floyd counties on the west side of the Blue Ridge.



Above—Headframe and new power house, Franklin Shaft.

Right—Crusher and sorting house, Melville Shaft No. 2

History of Region

Gold mining is not a new industry in Virginia. Some of the earliest known attempts at mining for iron and gold in North America were made in Virginia. In 1619, the first iron furnace in America, a bloom furnace, was built on Falling Creek about five miles south of Richmond, near U. S. Highway No. 1. In 1714, Governor Alexander Spotswood erected at Germanna, near the Rappahannock River in Spotsylvania County about 13 miles west of Fredericksburg, the first iron blast furnace in Virginia and one of the earliest in the United States. The history of these earlier operations, particularly the search for gold, is therefore interesting since the present explorations are being carried on in the vicinity of or at old mines which were opened up or operated between 1835 and the outbreak of the War Between the States.

The earliest accredited reference to gold in Virginia is by Thomas Jefferson in his "Notes on the State of Virginia," in which he describes a lump of ore found on the north side of the Rappahannock River about four miles below the falls (Fredericksburg). The gold "was interspersed in small specks through a lump of ore of about 4 pounds weight, which yielded 17 pennyweight of gold of extraordinary ductility."

Gold in place was discovered at the famous Whitehall mine in western Spotsylvania County in 1806. Watson states that this property was worked from 1848 until just before the War between the States and again as late as 1884 and that returns from the Philadelphia mint show it yielded $1,800,000 in gold. A pocket encountered at a depth of 28 feet is reported to have yielded $160,000 of gold.

According to records of the United States mint, the first actual production of gold in Virginia was obtained in 1829 from placer operations in Goochland County. This first deposit of Virginia gold amounted to $2,500. It is possible that some of it came from the Grasty tract in the Wilderness area in Orange County since the deed books of that county show that a one-half interest in a 20-year lease on a part of this mining tract dated 1829, was sold in 1831 for $30,000 in cash.

The first gold mining company incorporated in Virginia was the Virginia Mining Company of New York, which between 1831 and 1834 operated the

*Assistant state geologist, Virginia Geological Survey.

Grasty tract. The date of the incorporation was March 10, 1832. This company was succeeded by the Chancellorsville-Freehold Mining Company of London, who operated the property from 1853 to 1857. Following the War Between the States, operations were carried on by the Chicago-Virginia Gold Mining Co., 1879 to 1881; the American Gold Mining Company, 1881-1883; and the Gold Run Mining Company. The last operation was that of the Piedmont Mining and Metallurgical Company of Philadelphia, about 1910. This company was reported to have found at least three veins of from 3 to 5 feet in width and values ranging from $4.13 to $201.67 per ton. According to Watson, the operations of the above companies comprised 12 shafts totaling 578 feet and 1,400 feet of drifts and cross cuts.

The Vaucluse mine, about 9 miles north of the Grasty tract and adjoining the Melville mine on the south, also in Orange County, was opened up in 1832 and was one of the most prominent mines in the county. In 1843 its plant was valued at $70,000 and, according to Nitze, in 1847 this mine had one of the most elaborate plants for the separation of gold from quartz and pyrite in North America. During its long history, this mine was operated by several companies. In 1854 the Liberty Mining Company of England, capitalized at £1,000,000 had purchased the Vaucluse and the nearby Grymes properties at a reported price of £50,000. Previous to 1852, the Vaucluse had been worked by two open cuts 60 feet deep, 75 feet wide and 120 feet long. During operations six shafts were sunk. The long-abandoned open cuts and portions of some of the shafts may be seen today. In December, 1853, 50 tons of ore were reported to have been crushed daily and a mill run of 80 days made in the same year is said to have yielded 556 ounces and 6 pennyweight of gold of a fineness of 943½. The average yield of the ore was about $8 per ton.

In 1929, Henry Ford, the Detroit motor magnate, purchased the Vaucluse tract in order to obtain for his Dearborn Museum, certain pieces of ancient and historic machinery (reported to have been a pump, two boilers and a mining engine all of Cornish manufacture) which had been left on the property when operations were abandoned by the Liberty Mining Company shortly before the War Between the States. In December of last year the Rapidan Gold Corporation which is now operating the Melville mine adjoining the Vaucluse mine on the north, reported that it had acquired the Vaucluse tract from Mr. Ford. Officials of the corporation have recently stated that they propose to commence soon exploration operations on the Vaucluse tract and that such explorations will be carried on simultaneously with explorations and development work at the Melville.

The ore-bearing zone in the Vaucluse is said to have been as much as 30-40 feet wide in places and to consist mainly of veins and stringers of gold-bearing pyrite quartz in sericitic quartz schist. Some gold and pyrite were reported to occur also in the schist along the walls of the main mineralized zone.

Hoist, ore bin, sorting and crushing rooms, Melville Mine

About two miles northeast of the Vaucluse, in southeastern Culpeper County between the Rappahannock and the Rapidan Rivers is the old Culpeper mine. This mine was in active operation in 1836 when Silliman visited it and was operated intermittently from then until about 1905. The most profitable operations were said to have been just before and shortly after the War Between the States. In 1836 the workings comprised a shaft 57 feet deep and 531 feet of tunnels, adits and cross cuts, all in the oxidized zone, above ground-water level. Whitney reported that in 1854, 24 men were employed and that the mine was being operated with expenses of $120 a week. A 12 stamp mill and 2 Chilean mills were used in treating the ore.

During the last period of operation there were two shafts 100 and 120 feet deep and an open cut about 40 feet deep. The vein was said to be from 8 to 30 feet wide and to have averaged $6 per ton over its full width with pockets carrying values as high as $100 per ton. The mineralized zone was reported to be a strong massive quartz vein carrying abundant pyrite in a finely foliated dark gray sericite quartz schist.

About half a mile northeast and south, respectively, of the Culpeper are the Love and Embry mines, which are believed to be on the same vein and both of which have histories similar to that of the Culpeper.

The 700 acre tract containing the Culpeper mine has recently been acquired by the Paul G. Benedum interests of Pittsburgh, who are now developing the Franklin mine, about 8 miles north, in Fauquier County. It is the intention of the new owners to fully explore the Culpeper at an early date, as soon as explorations now in progress at the Franklin are more definitely advanced.

The Franklin, the United States and the Melville are among the oldest and most extensively developed mines in the northeastern portion of the Virginia gold belt and each has had a long and interesting history. Since these properties are the ones on which renewed explorations and developments are now being made their earlier history will be discussed under "Present Operations."

Others among the larger or better known mines in this region are the Marshall in Spotsylvania County, which up to 1854 is reported to have yielded $300,000, and the Eagle, in Stafford County, 14 miles northwest of Fredericksburg, which in 1885 is said to have had 10,000 tons of ore, carrying $10 per ton in gold, blocked out on three levels.

Mining operations were carried on continuously throughout the Virginia gold belt from about 1835 until about 1850, when the discovery of the rich gold strikes in California caused many of the local operators and miners to hie westward. In the early fifties there was a resumption of activity locally but with the outbreak of the War Between the States practically all mining activities ceased in Virginia and elsewhere in the South. Operations were again resumed shortly after the close of the war and from about 1875 to about 1900 there was considerable local activity in parts of the Virginia gold belt. In this later period milling and treatment plants were erected at several properties and many "secret processes" were tried out. But little success attended these attempts at further development and although some slight production was reported until 1926, active gold mining in Virginia may be said to have ceased about 1906.

Value of Gold Produced

From 1829 to 1926, records of the United States mint show the production of gold in Virginia to have amounted to $3,298,542. About one-half of this amount was produced between 1829 and 1879 and only about $9,200 was obtained within the past 20 years. From 1831 to 1850 the estimated annual production of the precious metal in Virginia ranged between $50,000 and $100,000. Since many of the early mines were owned by English operators it is probable that a part, in instances perhaps a considerable amount, of the gold produced was shipped abroad instead of being sent to the United States mint. It is therefore probable that the reported production data now available does not reveal "all of the story."

Early Operations

In Virginia, as elsewhere, the placer or gravel deposits were first worked and it is reported that in many places they were very rich. As the placers were exhausted, search was made for the veins or "mother lode" from which the placer gold was derived, and as they were discovered vein mining was begun. In the beginning primitive methods and crude devices were used and it appears very probable that many of the early operations were successful only because of the high percentage of free gold found, the thick mantle of decayed residual soil overlying the hard bedrock and the low costs of mining. In many instances both the placer and vein or lode deposits were worked by slave labor.

Where pannings of the surface soil showed much gold, shallow trenches

were dug and shafts or pits sunk, frequently to depths of nearly 100 feet, in the decayed residual surface material. Gold in quartz veins was recovered by crushing the ore and using various chemical processes for separating the free-milling (native) gold. Later stamp mills and Chilean mills were used for crushing and grinding the ore and amalgamation was used to recover the gold. During the last period of operation when, in many places, the deepened workings penetrated the sulphite zone, roasting and cyaniding processes were used with variable results.

Nearly all of the early operations were confined to the free gold deposits occurring in the zone of weathering (oxidized zone). Few of the developments attempted after the War Between the States proved successful. Operations were abandoned as (1) the workings penetrated below the ground-water level and the removal of water from the workings by pumping became too difficult or too costly, (2) the rock became harder and the ores too lean, or (3) the separation of the gold from the (deeper) sulphide ores encountered below the oxidized zone required a different kind of treatment from any of the processes then in use.

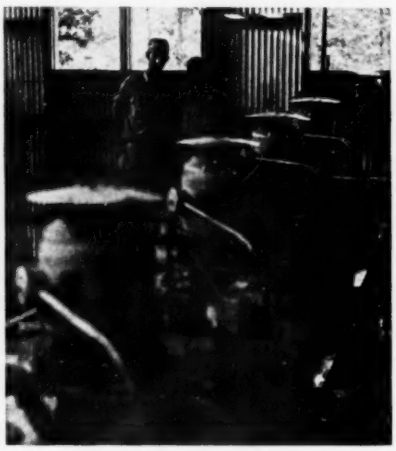
Poor management, inexperienced mining, inadequate or antiquated equipment, lack of capital, unfortunate promotional activity, and the fact that little consideration, if any, that was given to the relationship of the geology (kind and character of the rocks) of the region to the character and probable extent of the gold deposits, contributed in no small measure to the cessation of mining activities in the Virginia gold belt.

Geology of the Region

The rocks throughout the gold belt, which are geologically the oldest in the state (pre-Cambrian) are mainly hard crystalline rocks — micaceous, garnetiferous and chlorite schists and gneisses with numerous intruded masses of granite and diabase dikes. Altered sediments such as slate and quartzite occur locally. The prevailing strike is northeast and the dip is toward the east and southeast. The granites and similar igneous rocks cooled directly from molten lava. Some of the gneisses and schists are altered igneous rocks and some were primarily beds of sand, clay and limey muds which, in the varied and complex history of the Piedmont region of Virginia have been altered through heat, pressure and recrystallization so that they have lost all trace of their original character or structure.

Throughout the region veins, lenses, and irregular bodies of quartz which vary in texture from large crystalline masses to fine sugary grains, occur in the granite and schist. Gold, both free and intimately mixed with pyrite, occurs in the quartz and in places also in the enclosing rocks along the contact with the quartz bodies. The gold-bearing quartz veins conform in general to the strike and dip of the enclosing rocks. Although the deposits vary in character from place to place they are intimately related and all owe their origin to the intrusion of the granite masses into the older, altered, sedimentary rocks. In and along the granites the quartz bodies have the appearance of fissure veins whereas in the schists they occur as irregular lenticular masses or in places as a series of irregular stringers and lenses mineralized zones.

In the past the upper or near-surface (oxidized) portions of the vein deposits were successfully worked, to depths of from 60 to about 200 feet, but as the primary (sulphide) deposits below the ground-water level, when and where encountered, were generally of low-grade, few attempts were made to explore the lower, deeper sulphide zone and operations were abandoned. It has only been recently that definite attempts have been made to really explore the deeper portions of the deposits and the progress of exploitations in progress indicate that many of the veins were probably formed at great depths and that as yet but meager information is available regarding the possibilities of the deeper, sulphide zone.



Flotation Cells, Melville Mine

Present Operations

Since 1929 there has been much interest in gold mining throughout most of the gold-producing countries of the world and considerable prospecting and exploratory work has been done. Partly because of this and partly because of the history of many of the old mines and the belief held by some that "pay ore" was still to be found in portions of the Southern Appalachian region, geologists and experienced mining men have, in the past three or four years, visited and examined many of the former gold-mining localities in Virginia. As a result, three ably financed companies have been organized to fully explore certain selected properties and to determine whether minable bodies of sulphide ore exist at depths deeper than most of the old mines penetrated and whether such bodies, if found, contain gold in quantity to be profitably operated by modern mining and milling methods. Exploratory operations are now in progress on three properties in a roughly triangular area west and northwest of Fredericksburg in northeastern Orange, northern Spotsylvania and southeastern Farquier counties. In addition prospecting work has been done, and it is reported that explorations will shortly be commenced, on other properties in these and in Culpeper and Prince William counties. These explorations are being made under the management and direction of experienced geologists and mining engineers and modern methods, machinery and equipment are being used. The progress of these operations are being closely watched by mining men, geologists, and an interested public and the results obtained by them will probably determine to a large measure the future of gold mining in Virginia. Should these operations prove successful in developing paying gold-bearing bodies, Virginia and others of the Southern Appalachian states may experience a real gold mining boom and attain to prominence in the mining world.

Rapidan Gold Corporation

Some 2½ years ago, Mr. Moritz Norden, a mining engineer of many years varied experience in Mexico and the western part of the United States, who had become interested in the Virginia gold-belt came to Virginia from Arkansas and made a personal inspection of many properties in the Wilderness area. After many months of detailed prospecting he became convinced that the possibilities of finding minable bodies of sulphide ore beneath the oxidized zone in which most of the earlier operations had been made, warranted a definite test. As a result, the Rapidan Gold Corporation was organized with Mr. Norden as president and with sufficient capital to thoroughly explore the old Melville (formerly known as the Grymes) mine, about 1½ miles northeast of and adjoining the Vaucluse, which had been acquired. The mine is about 18 miles west of Fredericksburg, about 3 miles northwest of the Wilderness store, north of the Fredericksburg-Culpeper highway (State Route No. 3).

The Melville property had been extensively worked, both from the surface and underground during the period of active operation in the Wilderness area and its history is said to have been very interesting. It was at one time owned and operated by the Liberty Mining Company of England, one-time owner of the Vaucluse, and many interesting implements and pieces of machinery, believed to have been imported from England, were found on the property by the new operators. It has been reported that about 12 years ago, attempts were made to mine and treat the sulphide ores found there by previous operators. Crushing, roasting and cyaniding were among the treatment methods said to have been used but no data is available concerning the results obtained and the operations were later abandoned.

Within a very short time after its incorporation the Rapidan Gold Corporation commenced active explorations on the Melville tract, under the manage-

ment of Mr. C. Hyde Lewis, a mining engineer who had been associated with Mr. Norden in Arkansas and who has also had much experience in some of the western mining districts. Portions of nearly all of the old caved surface workings were cleaned out and examined and an old shaft was dewatered, cleaned out and deepened to a depth of about 125 feet. The workings, drifts along the vein, were dewatered and cleaned out and about 500 feet of drifts and cross cuts were opened up.

The results of these explorations and the showings of sulphide bearing ores, as determined by assays of samples from various parts of the workings were sufficiently encouraging for the management to recommend further detailed exploration and the erection of a pilot mill to treat the ore already found and that which would be recovered in extending underground workings. Accordingly additional capital, to an extent to carry forward the additional explorations, was obtained and about the same time the management announced that, through Mr. Norden, it had acquired from Mr. Henry Ford, the adjacent Vaucluse property containing the famous Vaucluse mine, which lies about 1½ miles southwest of the Melville along the strike or trend of the ore-bearing zone encountered at the Melville.

In December, 1933, a new shaft was started, about 150 feet from the first and the erection of a modern mill, and an enlarged power house was commenced. A 50-foot headframe was erected at the site of the shaft, so constructed as to be an integral part of a large coarse ore bin. The shaft, a modern two-compartment vertical shaft has been sunk to a total depth of 240 feet. It is fully timbered, 8 by 8 inch oak square sets being set at intervals of 6 feet and the shaft lined with 2-inch oak planks. Each compartment measures 4½ by 4½ feet. Hoisting is done with a 2-ton automatic dump skip running in guides and having safety dogs. The second compartment is used for ladders and water, air and lighting lines. A 4-inch air line is used.

Water from the mine is used for the power house (cooling engines), mill, and drilling underground. From a large sump, below the lowest level, water is pumped, by an Ingersoll-Rand 2-stage electrically driven motor pump, having a capacity of 150 gallons a minute with head, to the surface and thence through a 4-inch surface line to 3 elevated, 10,000 gallon, wooden storage tanks. From the tanks the water is piped to the mill and powerhouse. The mine is now making about 90 gallons of water a minute which is ample for present drilling and mill operations. With additions to the mill water will be pumped, via a surface pipe line, from the Rapidan River, about half a mile to the northeast.

The new shaft is northwest of the ore zone and cross cuts from it lead to new workings along the ore zone on levels at 112 and 220 feet. Drifts have been driven along both the footwall and the hanging wall on both levels; about 1,300 feet on the upper and about 1,400 feet on the lower. The management states that about 2,000 feet of openings—drifts and cross cuts—have been driven and that about 50,000 tons of ore have been blocked out.

The ore zone is composed of lenses and stringers of pyritic quartz in foliated schist, and varies in width from 20 to 45 feet. It has the appearance of a shear zone and strikes N. 30°-40° E. with a steep dip, nearly vertical, to the northwest. Pyrite, which assays show is auriferous, occurs in lenses and stringers and also as enclosed masses in the quartz. The highest gold values are found along the hanging- and foot-walls.

In the month of June, 1934, the management estimated that 14,000 tons of ore were blocked out and 350 feet of new development work done. No stoping is in progress at the present time, the main operations are confined to development work. It is proposed to extend the drifts and to cross cut at intervals of 100 feet, to investigate the character of the entire ore-bearing zone, and to determine the feasibility of mining the full width of the ore zone.

Mill Interior Showing Sacked Concentrates

On June 7, 1934, the first shipment of concentrates (50 tons) from the newly erected mill went forward to the American Metals Co., Ltd., at Parteet, N. J. The shipment was estimated to have a value of about $7,000. This is the first shipment of gold of any importance that has been obtained from any of the Virginia gold-mining areas in 75 years or more.

The ore is brought up the shaft in 2-ton buckets and automatically dumped into a chute which feeds into a large coarse ore bin at the shaft. From the bin the ore passes, on a rubber sorting belt 30 inches wide and 20 feet long, through a sorting room where hand-sorting is done. From the sorting belt the ore is fed to a 1 inch grizzly where the separation really begins, thence to a 10 by 16 Farrell jaw-crusher where it is crushed to 1 inch or finer. After being crushed the ore is fed on to a conveyer belt, 14 inches wide, which carries it up an inclined passage 100 feet long and discharges it into an 80-ton fine ore bin above the mill.

The mill, of frame and sheet iron construction, has a concrete foundation, is well lighted and is modern in every respect. The "flow sheet" of the mill is relatively simple and the equipment and machinery are of the most modern and approved types. From the fine ore bin the ore passes through a chute and is fed by a Hardinge automatic weight feeder into a 6 x 22 Hardinge ball mill in closed circuit with a Dorr 27-inch by 18-foot single classifier. On a balcony-like platform at the head of the mill above the ball mill and classifier are a set of three Oil Reagent Feeders manufactured by the Denver Equipment Company. These contain the (oil) flotation reagents which are used to effect a separation of the (gold from the other) minerals in the ore. The reagents used are American Cyanamid Co. No. 208 (Aeroflote), Zanthate 301, and Pine Oil, General Naval Stores No. 5. From the first of these feeders, the pine oil is automatically and continuously fed into the ball mill, and from the other two the A. C. C. 208 (Aeroflote) and Zanthate 301, are fed into the ore flow line between the classifier and the flotation cells.

The overflow from the classifier goes to 4 Fagergrow (American Cyanamid Co.) flotation cells, where separation of gold concentrates is really effected. Three of these cells are used for roughing and one for cleaning. The frothy concentrates from the cells are dewatered in settling boxes, arranged in rows below them. Then the concentrates are dried to 3 percent moisture on a flat topped drier, sacked in canvas bags and shipped to the smelting plant of the American Metals Co., Ltd., at Parteet, N. J., for final recovery of the gold.

The management reports that "slightly better than 90 percent recovery of gold content" is obtained. The tails average from 20 to 30 cents a ton and the heads, due to drifting and development work being carried on in the levels from which the ore is being mined, range from $4 to $5 a ton. It is reported that values of $5 to $6 per ton are obtained from material taken across the ore zone and including lean portions thereof.

The following sample assay of concentrates is reported by the management:

Gold (Au)	3-5 oz. per ton
Copper (Cu.)	0.32%
Iron (Fe.)	25.65%
Silica (SiO_2)	28.70%
Sulphur (S.)	25.59%
Arsenic (As.)	0.07%
Antimony (Sb.)	Trace
Aluminum oxide (Al_2O_3)	7.57%
Silver (Ag.)	0.07 oz. per ton
Calcium oxide (CaO.)	0.21%
Lead (Pb.)	Trace
Zinc (Zn.)	0.37%

A small modern assay office and laboratory provide adequate control and quick check on samples from both the mine and the mill, which are taken daily between 7 and 8 a. m. Returns of assays are available by 1 p. m. Underground, 20-lb. face samples are cut with a moil immediately after blasting and these are then checked against 50-lb. grab samples taken from the muck pile

(containing material) from the same face. Classifier overflow samples from the mill are sorted by an automatic mechanical sampler. The equipment in the assay office includes a large brick, oil-burner drier, capable of drying 30 samples in 2 hours time; a small chipmunk crusher, a Braun pulverizer, a Braun combination crucible and muffler furnace, and 2 modern bead balances.

The surface plant is modern and not only ample for the present operations but adequate to comfortably take care of much more extended operations. A large, airy, well-lighted and screened mess shack with annexed kitchen provides a happy and favorite gathering place for all hands at eating time. A change house, about 20 by 40 feet with a concrete floor, boasts hot and cold water showers, lavatories and lockers for the employes. About 60 men are now employed at the Melville and about half of these live in new electrically lighted and screened shacks constructed on the property by the management. The labor is mostly from local farms and about half of the men live at home.

The power house contains 1 four-cylinder 240-horsepower Fairbanks-Morse Diesel engine directly connected to an A. C. generator, a 2-cylinder 120-horsepower Fairbanks-Morse Diesel engine also directly connected to an A. C. generator, a 460 cubic foot Ingersoll-Rand compressor, and a 50-horsepower Ledgerwood (General Electric) hoist motor.

The office is the headquarters from which all operations and explorations are studied, planned and directed. Here are located the desks and work tables of the general manager (who is also chief engineer), assistant engineer, draftsman, sampler, bookkeeper and headquarters clerk. Here are kept all records of progress and production, charts, maps and from here also is close contact and constant watch kept of all activities.

The Melville tract comprises about 800 acres which is held by the present operators under bond and lease. The adjoining Vaucluse property which is owned in fee simple, embraces about 200 acres and some 500 acres in additional tracts provide an ample acreage for extensive operations if results of present explorations warrant such development. According to the management the present holdings cover a distance of about 9,000 feet along the strike of the ore-bearing zone in a N. 30°-40° E. direction.

At this time explorations are in progress only at the Melville mine. The mine is being worked on two 8-hour shifts 6 days a week, whereas the mill is operated continuously, on three 8-hour shifts. Operations include prospecting and development (drifting and cross-cutting) and actual ore production. The plant of the Rapidan Gold Corporation at the Melville mine is valued at more than $100,000.

Prospecting has been done on parts of the Vaucluse tract and it is the intention of the management to carry on further prospecting and to actually begin exploration work at one or two localities along the old Vaucluse workings (vein) as soon as a little more progress has been made on the extension of the levels now being driven in the Melville.

Interior of Melville Mill

Paul G. Benedum Interests

Following detailed investigations, which included a thorough physical examination, of a number of former mines in northeastern Virginia the Paul G. Benedum interests of Pittsburgh, Pa., acquired in the spring of this year the old Franklin property embracing some 594 acres, about 3 miles east of Morrisville, in Fauquier County, and the 700 acre Culpeper tract in southeastern Culpeper County. The latter tract is about 1½ miles northeast of the Melville mine, now being developed by the Rapidan Gold Corporation. The Franklin mine is reported to have been worked in a desultory manner from about 1837 to about 1877, during which time 100,000 tons of $12 ore is said to have been obtained from 700 feet of underground workings. The average value of 10 samples taken from the workings at a later date are reported to have shown a gold content of $24.24 per ton. The last previous attempt at operation so far known, was in 1904 or 1905. The mine is about 26 miles northwest of Fredericksburg, accessible via State Route 17 to Morrisville and thence via a good local sand clay road to the property.

On March 10 last, shortly after the title to the property had been acquired by Mr. Benedum, active explorations were commenced under the management of Mr. George E. Wearing, a mining engineer of wide and varied experience. The collar of the old abandoned shaft was stripped and the shaft cleaned out to ground-water level. A concrete collar was built as a foundation for a new headframe. This was of ample size and permanent nature in order that should future developments warrant it, the shaft could be converted into a permanent air shaft or used for dewatering the underground workings.

The reconditioned shaft is in reality a new one. It is a double compartment vertical shaft timbered with 8 by 10 inch beams and 8 by 8 inch regulation mortised square sets with 8 by 10 inch dividers. The shaft measures 5 by 9 feet on the inside, clear of timbers. The hoisting compartment is 5 by 4 feet 4 inches clear of heavy guides. All timbers, lagging and guides are of first grade oak. The headframe has been designed to handle 500 tons or more of ore per day, using a 35-ton bucket. The second compartment is used for ladders (manway), water, air, electric light, and blasting control lines. The shaft has been carried to a depth of 90 feet with a pump beneath to take care of the water. The shaft is now making 118 gallons of water per minute.

At a depth of 55 feet a short cross cut leads from the shaft to one of the old abandoned levels, which has recently been cleaned out for a distance of about 500 feet along the main vein (No. 1). The vein, a massive quartz vein with an average width of about 20 feet on the upper (old abandoned) level, has, according to the management, been followed for more than 750 feet along the strike for which distance it is reported to maintain a width of 20 feet. Since the new explorations have been commenced the vein has been sampled at regular intervals for the distance now exposed, and it is said that assays show values which give promise of commercial operations if large ore reserves are proved at greater depths. A second vein, called No. 2, the location of parts of which is indicated by abandoned and caved surface workings, occurs 156 feet east of No. 1.

No drifting or cross cutting is now in progress, the sinking of the shaft being the present major project. It is proposed to sink the shaft to a depth of 235 feet or greater and then to drift along vein No. 1 and cross cut to vein No. 2, to gain sufficient knowledge of the veins, their continuity and persistence and the values of the ore shoots.

The orebody so far as determined appears to comprise mainly sulphides which according to the management respond by test to flotation treatment. The No. 1 vein has the appearance of a strong fissure vein.

(*Concluded on page* 23)

Wheels of Government

SEPTEMBER stands as unique among all the months that have come and gone since the New Deal began. Though the wheels of Government continued their interminable turnings, national attention for the first time since the opening of the Roosevelt administration was directed toward developments other than those relating to the recovery program.

That effect was only produced, however, when a major maritime disaster and the "break" in the world's most famous kidnapping case took command of the public consciousness. The fact that eyes were turned away from recovery efforts only when two events of that proportion appeared serves to indicate how tensely and continually the Nation's gaze has been riveted upon recovery activities.

In the meanwhile, developments in Washington and at Hyde Park were budding in the usual volume. And it can be said that these governmental developments during recent days have been of a type not previously on view.

The administration's devotion to the "special board" method of dealing with major industrial conflicts again was revealed in the moves made to accomplish a settlement in the textile strike situation.

Just before the textile board made its report to the President, however, General Johnson delivered an address in New York City which injected the "vertical union" principle of labor organization into the current picture. General Johnson forecast, in effect, at that time that "industrial unions" would receive governmental and industrial sanction and intimated a system based on such unions would be initiated in fairly short order. Nothing more has been heard on that subject, however.

More striking than anything the General had to say along that line, however, were his statements that he had had the constant counsel of a justice of the United States Supreme Court, whom he mentioned by name. He even went so far as to imply that member of the Nation's highest tribunal was of the opinion that NRA is too unwieldy to function effectively.

These statements, coupled with others which found the General charging the textile unionists with breaking a pledge, might not have been so important were it not for the fact that General Johnson's personal relationship to the recovery organization had been a question of high consideration during several weeks.

In the opinion of many observers, that speech brought full certainty that General Johnson soon would take his leave of NRA. In any event, his resignation was accepted before many days had passed, as the whole wide country knows by this time.

As the President returned to Washington from Hyde Park, interest centered upon the form to be given NRA organization.

Conclusion of the "one-man control" and appointment of a board to administrate NRA affairs was effected, with control by a board being introduced. The effect of this substitution upon NRA will not immediately be apparent. Observers did note, however, that the members of the boards named following General Johnson's departure are generally of the "liberal" type.

Mining men will find more than interesting the developments in the NRA and the quiet but definite plans now under way to revamp the recovery organization more along the lines proposed by Donald Richberg and Secretary of Labor Perkins.

Assurances are that the NRA will not be allowed to lapse and that drafts of legislation are now being prepared, which, if enacted, will insure the continuance of NRA as a semi-permanent agency but with much of its pristine glory as a "policeman" over industry gone.

The feeling that industry might now be better off with some of the price-fixing features removed is prevalent in higher Administration circles and this feeling is almost sure to find expression in the final form of the legislation proposed.

What will remain is the hour provisions in various industries, the exclusion of child labor, and certain minimum wage provisions, it is believed.

Thus it becomes increasingly evident that the ideas of Richberg and Miss Perkins, definitely favorable to labor, are likely to be the basis of the new NRA. The general opinion is that NRA tends increasingly toward a safety measure for labor on the assumption that industry can take care of itself. This idea is helped along by the reiterated declarations by big business for less government control in industry, a fact which some Administration heads are inclined to test out while retaining the provisions which insure labor Governmental support in many of its claims for recognition.

The agitation for shorter work week legislation, talked about for years and actively sponsored in the last Congress, is becoming increasingly marked as the time for the convening of the 74th Congress approaches. Labor organizations are in the van of the movement, of course. But Administration studies made by economists have swung many key officials toward a feeling that a national shortening of work hours might be one way of eliminating the imposing unemployment list totals. A study nearing completion discloses that even in the best times there are many millions of unemployed and that as the population increases and mechanical ingenuity becomes more evident there will be continually smaller field for hand efforts.

This is, of course a long-time problem but the present Administration has already distinguished itself by its planning for the future and this is one problem that it intends to tackle with the idea of an eventual solution.

The billions paid out in relief have set Administration chiefs to figuring, looking toward the day soon when these

vast expenditures can be cut materially. Although a return to normal conditions will remove the majority from relief rolls, the figures now at hand indicate that at the best from two to three million and possibly more would be unemployed. This figure is added to each year by the nearly 400,000 young people who reach working age and whose total far exceeds the number of workers who retire or die each year, this latter figure becoming smaller each year due to the advance in medical science and other aids to longevity.

There is little question that in the social legislation likely to be sponsored by the Administration, such as unemployment insurance and old-age pensions, there will crop out strong agitation for shorter work week legislation. This may not be Administration sponsored but the present trend is that many important Administration officials favor such legislation as a "trial measure" to see what it will do for the country economically.

There are many important factors which may make such legislation inadvisable. The most important is whether or not the nation is definitely recovered enough from the depression to warrant the added burden that such a measure will throw upon the entire population. Also entering into the picture is the long-time factor that such a step will raise materially the standard of living of the country, eminently worthwhile from a domestic standpoint but of incalculable danger so far as foreign trade is concerned in that American prices will preclude purchases abroad of our products.

This latter picture enters most importantly into one of the Administration's chief affairs at present; the negotiation of reciprocal trade agreements with foreign countries.

These are proceeding rapidly at present with one completed; two others, Brazil and Belgium, nearly completed; eight more, Sweden, Colombia, Nicaragua, El Salvador, Haiti, Costa Rico, Guatemala, Honduras, being negotiated, and announcements made for the twelfth, that with Spain for the late next month.

Even at present the higher cost of American products, although in many cases superior to the competitive article, makes it difficult to bargain with foreign powers on a most favored nation basis for reciprocal purchase of products.

Added increases to the cost of production might well raise the cost of both raw and manufactured products in America to so prohibitive a figure as to prevent any possibility of foreign exchange and thus erect a new kind of tariff barrier, not even dreamed about by the high-tariff protagonists.

The Administration's constant espousal of labor has resulted in an overbalance of the entire industry-labor picture, according to Washington sentiment. Labor, in many cases ill-equipped to participate in and take advantage of the changing situation, has jumped far out of bounds originally intended and the Administration now finds itself in the position of the man who was holding the bear by the tail and is afraid to let go.

Out to definitely better labor's status in the belief that such measures would help restore prosperity, the Administration now finds that in many cases the labor element has far exceeded in its demands what either industry or the country can meet.

But there is no tendency to alter the pro-labor policy of Federal agencies which are concerned with these problems. Most of these, manned by liberals, are of the definite opinion that although in some cases the demands of labor are far fetched, the swing of the pendulum to the left is inevitable after years during which labor, they feel, was not receiving its just share.

Industry, however, finds that its best argument is the action of labor itself. Already there is a definite feeling in Washington and particularly in Federal agencies whose functions are connected with labor matters and controversies, that a reaction has set in against "wild" demands of labor.

The National Labor Relations Board continues to expedite hearings of cases. Its recent speedy action in asking the NRA to remove the Blue Eagle from the Houde Engineering Co., as the result of the adverse decision recently ordered against that company was taken without delay and it now awaits the action of the Department of Justice in prosecution. Heretofore the latter department has not met the speed of other agencies in NRA cases brought to trial and there is much speculation on whether the militant Chairman Garrison will make a point of "urging" no delay by the Justice Department.

Important is the announcement by the National Association of Manufacturers to their members to disregard the National Labor Board decision in the Houde case pending court decision on the matter.

Also interesting is the decision of a Federal district judge at Wilmington, Del., subpoenaing the National Labor Relations Board and its records in the Weirton Steel case. The trial of the matter is set for Oct. 2, and the employes of the Weirton Company affected as well as board members and their records have been ordered for the trial by the court in agreeing to a motion made by the steel company's lawyers.

The Treasury taxation study nears completion. Prof. Roswell Magill, in whose hands most of the data has been placed for coordination, is engaged in the arduous task of compilation and resume. Included in the report to be made by him—and possible recommendations—are expected indications of loopholes in Federal taxation of past years; means of increasing revenue through other taxes, possibly higher percentages in the larger income brackets.

Despite the heartening assurances of Senator Pat Harrison, chairman of the Senate Finance Committee when he said that it was hoped that a new revenue bill would not be needed to be passed by the next Congress, it is generally believed that this was the usual political reassurance talk preceding election and that there was little question of a new revenue bill which would help meet the mounting burden of Federal expenditures which promise to run the public debt to a new all time high total of 32 billions before the end of another fiscal year.

The recent report delivered to the President by George N. Peeke, special advisor on foreign trade, calling attention to the vast interest of American investors in foreign countries; our loans abroad; the financing and sale of billions in securities of foreign powers which, in many cases, are now worthless or nearly so; our lack of knowledge of where and how our money has been invested abroad; all these combine to give a startling picture to the American investor.

The report may serve as a lever for Federal supervision of future lending abroad, particularly inasmuch as our credit position has placed us in an awkward and damaging position in securing foreign trade, not to speak of the fact that a good portion of the 25 billions Americans have invested abroad can now be written off as a total loss. It becomes doubly interesting when it is realized that only 10 billions of this sum represents the so-called war debts.

MENTION HAS BEEN MADE in previous issues of the Bulletin of the provision in the Loans to Industry Bill of the section providing loans for the mining industries.

The Reconstruction Finance Corporation has recently issued a circular giving full details on the applications under this section. Copies of the circular (RFC Circular No. 14) may be obtained from the American Mining Congress.

Several important provisions in the circular are noted. Loans will be made to provide working capital or for fixed capital purposes such as construction improvements, repairs, purchases of equipment, etc. Only established corporations, partnerships, or individuals are eligible and these must have been in the business of "mining, milling, or smelting of ore." Ore is defined as "any native compound from which a metal or metals can be extracted at a profit. Thus coal and other nonmetallic minerals, salts, or other substances taken from the ground do not come within the purview of this section."

Also important is the definition of "mineral acreage" under which the act defines loans may be made. This is defined as "mining property on which there has been a reasonable amount of development and at least a partial blocking out of ore." Attention is called to the fact that applications for loans should be filed direct with the Reconstruction Finance Corporation at its office at 1825 H Street N. W., Washington, a procedure differing from the usual in that ordinarily RFC loans are applied for through the regional offices.

BUREAU OF MINES . . .

Committee Activities

AMAZING facts and striking evidence has been developed under the direction of the American Mining Congress, through its National Committee for the Rehabilitation of the Bureau of Mines. The facts and evidence indicate strongly the extent to which the Federal Government has been according "Cinderella treatment" to the Bureau of Mines and to mining in general.

Special editorial activities were advanced at Washington during September for the purpose of placing the information concerning the bureau and the mining industry in form which will command the greatest possible volume of attention.

October will witness publication by the committee—of which Mr. Eugene McAuliffe, President, Union Pacific Coal Company, is chairman—of a pamphlet which will be issued for the major purpose of inducing a better understanding of mining.

The booklet has been designed to provide an attractive appearance which will invite the attention of a wide range of readers. At the same time, preparation of the text for the booklet has called for use of extreme condensation. The number of words thus has been reduced to the smallest amount possible without neglect of essential facts.

It is believed this booklet will present the first concise study of its type.

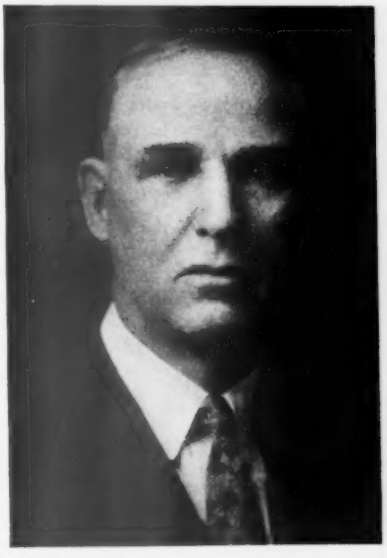
The first section of the booklet will present facts indicating the economic importance of the mining industry, with specific and up-to-date information concerning the number of mines, number of workers, annual payroll, annual State and Federal taxes paid, communities dependent in whole or in part upon mine operation, and many other similar types of information.

Also, a study of the functions of the Bureau of Mines and the services rendered by that agency will be placed before readers' eyes.

Each of the four branches of the bureau—Health and Safety, Technologic, Economic, and Administrative—will form the subject of an individual chapter. Prefacing material will be presented under the title, "Guiding and Guarding."

Another section of the booklet will be devoted to an impressive outline of the manner in which Uncle Sam has accepted approximately 100 times as much money from the mining industry in Federal tax payments as he has seen fit to provide in appropriations to the Bureau of Mines, for the advancement of safety and efficiency in the Nation's mine operations.

Finally, succinct and pointed suggestions are offered for improvement of the existing condition which finds the Bureau of Mines greatly handicapped in performing the duties assigned to it under mandate of law.



EUGENE McAULIFFE

National Chairman, Committee on Rehabilitation of the Bureau of Mines

Accompanying the text will be attractive and impressive charts which will present related statistical information.

Assurance that facts being developed by the committee will receive wide consideration, through distribution of the booklet and through other means, is found in the fact that newspapers throughout the country have recognized the vital character of the information which it is making available.

The first compilation of facts by the committee, issued in the form of a general statement, was broadly printed throughout the United States during the third week of September.

The text of the committee's statement follows:

"Safety of thousands of men who work below the surface of the earth is being jeopardized by sharp curtailment of Federal efforts to protect miners from accidents and disasters. This is revealed as a special committee of the American Mining Congress concludes a study which shows lack of funds has dealt a heavy blow to the Government's mine safety program, in force during a quarter of a century.

"Nine mine rescue cars, long operated by the Bureau of Mines to combat disaster conditions and to serve as training headquarters, have been taken out of service, leaving only two of these pieces of special railway equipment to cover the entire country. The bureau's health division has ceased operations after having worked in co-operation with the United States Public Health Service during many years. Scientific research advanced by Federal experts during more than two decades to increase safety in mines has been brought almost to a halt, the survey indicates.

"These life-protecting activities, which extend into virtually every state, mostly are of the type that can be conducted only by an independent and unbiased agency which is not interested financially in mining operations, it is indicated in the committee's report. Supervision of the use of explosives particularly, falls within that category.

"With no other Federal unit designated or equipped to conduct these activities which already are credited with extensive savings of lives, the Bureau of Mines has been forced to discharge more than 500 employes because appropriations made available to it have been cut virtually in half.

"The report cites Federal records which show the bureau's funds for the current fiscal year to be smaller than the annual allotment in any year since 1920. This condition, it is pointed out, prevails despite the fact that much work has been transferred to the unit from other governmental agencies during that 14-year period.

"Enforced curtailments have particularly affected the training of men to help themselves and others when disasters occur underground. The scope of first-aid instruction and accident-prevention training also has been greatly

(*Concluded on page* 38)

A Forthright Declaration of Policy

THE WESTERN DIVISION of the American Mining Congress, representing the mining industry of the West, in conference assembled at San Francisco on September 27, 1934, presents the following statement of facts and announces its position with respect to those political, economic and social movements which affect this industry and retard its recovery.

Our industry is founded upon the courage and toil of the prospector, the faith of the capitalist, the skill of the technician, the competent guidance of its executives and the labor of its workmen. Its preservation depends upon the continuance of these united efforts through which the treasures of the earth are found, extracted and made into the innumerable useful products which contribute to the needs, comfort and happiness of mankind. The history of this industry is written in the conquest of the West. Our mining industry is the monument to the men and women of the West—their contribution to America's development.

Five years ago the Western metal mining industry alone supported more than 1,400,000 persons. But today more than 1,000,000 of these people are either dependent on some form of relief or have forced an equal number of others to the relief rolls. During this period the liquid assets of the companies in this industry have shrunken more than 40 percent, their surpluses more than 50 percent and their dividends have practically vanished.

During this last five-year period our industry has cared for the families dependent upon it for their livelihood as best it could. After five of the most distressing years in its history it can face the world and say that it has "Done its Part."

The mining industry is dependent upon a general recovery of all industry. Its products go largely into the manufacture of those goods needed for plant extensions, heavy machinery, building operations and replacement of transportation equipment. Unfortunately these industries show no sign of recovery. Tremendous surpluses of the products of our mines have accumulated. Uncertainty of governmental policies retard the long term investments necessary to recovery in the capital goods industry. Until that uncertainty is removed, the mining industry must stand by, a sufferer, because of policies not clearly defined. It is imperative that doubt shall be removed, and definite policies be formulated and announced. Until that has been done, no adequate market for the products of our mines can be expected.

The labor policy of the Government, beginning with the enactment of 7-A of the National Industrial Recovery Act, has not only added to the cost of production of metals, but likewise has added to the cost of production of machinery and supplies and has created a feeling of uncertainty which militates against future commitments and undertakings.

We believe that labor is entitled to the highest wage this industry can pay. The amount which can be paid to labor is measured by the income less necessary deduction for maintenance and extension of production facilities for the payment of taxes, for the finding and development of ore to replace that which is used up in the course of operations and for a return on the capital invested in amount necessary to retain it in the industry and attract new capital when needed. We believe, therefore, that the establishment of wage levels by legislation or fiat of governmental authority is contrary to sound economic principle and is opposed to economic recovery. Wages are paid from income and income is not created by law but only through production of goods.

Restrictions upon the investment of capital in all industries, in the opinion of this conference, are a major factor in the continuance of the depression. Particularly does this apply to the mining industry. Plant extensions, new commercial enterprises and building operations are constantly dependent upon new capital investments. The mining industry is in thorough sympathy with legislation and administration to curb the vicious practices which contributed toward the collapse of our credit structure. The industry is realistic enough, however, to believe that one should not burn down a house to kill a rat.

Uncertainty as to the future monetary policy of our Government has contributed to delay in full recovery. The mining industry, producing a basic element, has suffered because of this general hesitancy. This conference feels that definite announcement of our national monetary policy should be made and that in the formulation of such policy due consideration should be given to the restoration, establishment and maintenance of silver as primary money in accordance with the authority given the President under existing legislation.

In common with all industries, mining has been affected by the constantly increasing costs of government, by threat of taxation as an instrument for the redistribution of wealth and fear that the mounting burden of debt, which must be met out of the income of this and succeeding generations, may lead to destructive inflation of the currency.

This conference, having in mind the causes of its present condition, realizing its dependency upon the stability of Government and the general recovery in all lines of business, presents the following as its platform of policies:

FIRST: We adhere to and believe in the traditional form of constitutional representative Government established by the founders of this Republic, and we demand that the next Congress reassert and reassume its traditional function as a coordinate branch of the Government.

SECOND: We demand that the budget be balanced without delay, and that the Government relief be placed on a permanent basis of law, and that it be removed from partisan politics.

THIRD: We demand stabilization of monetary policies and definite assurance that taxation shall be used only as a means of securing necessary revenue and not as a means of distribution of wealth, and that there shall be no inflation of the currency.

FOURTH: We demand that the Government shall retire from business in competition with its citizens and that it shall refrain from interference in the conduct of business except insofar as may be necessary to protect the rights of all citizens.

FIFTH: We demand that labor be given the right to representation in collective bargaining by those of its own selection; that the plan of proportionate representation of labor in any industry shall be recognized and that the right of the individual, not a member of a labor organization, to conduct bargaining by means of his own choice, shall not be restricted or abridged. We condemn any policy which shall constitute any labor organization, national or international, the sole representative of all those employed within an industry. We recognize the right of men employed in the mining industry to join or refuse to join any labor organization, and we condemn coercion by employers, labor officials or any other agency which shall interfere or limit such right.

We further demand that employes who desire to work shall be fully protected by the police powers of constituted government and that mob law shall not be tolerated.

Metal Meeting and Exposition at San Francisco

MARKED by intensity and earnestness, the meeting of the Western Division of the American Mining Congress—held at San Francisco, September 24-29—produced a determination that the mining industry shall receive recognition which is its due as a major economic unit.

The meeting, attended by more than 1,000 mining men and other persons with related interests, found definite form given to the conviction that the time has arrived for the mining industry "to rise up and make its voice heard." During a long period of time, it was stressed repeatedly by speakers, the nation's second industry has paid heavy taxes and has borne an exceptionally large portion of the burden of depression. Throughout that period, the industry has made no call for governmental aid of the type that has been extended to other quarters.

Because mining has not crumpled up in the face of adverse conditions and has not made demands upon the Federal Government for outright financial aid and support, it is deserving of full cooperation in its efforts to effect recovery for its sake and for the sake of the nation's economic welfare. Such was the predominant tone of expressions during the San Francisco meeting—a gathering that will occupy a prominent place in the history of the mining industry.

The sessions revealed members of the American Mining Congress as having constructive ideas about governmental action that can be taken to enliven the mining industry. The industry's broad range of operation—reaching into virtually every section of the United States and furnishing materials for hundreds of other industries—dictates that such action should be taken, it was emphasized repeatedly.

Placing opinions and conclusions in clear and concise form, the meeting resulted in adoption of a platform which sets forth the moves which the Government should make to enable the mining industry to free itself from uncertainties that now beset it.

The "platform of policies" adopted by the meeting, appearing in full text on the opposite page, sets forth adherence and belief in the traditional form of constitutional representative government and presents five distinct and fact-supported demands.

Reference to the text of the platform indicates clearly the vigor and earnestness which characterized the sessions which produced the outline of policy.

Though newspaper reports of the meeting created the impression that "attacks on the administration" had been launched at the meeting, the sessions were devoid of the "spirit of attack" as the term generally is used. Rather, there was at all times present a desire to develop sound facts and to make those facts the basis of constructive suggestions and criticisms for the purpose of aiding the mining industry to recover its position as a great employer of men and producer of national wealth.

Even before the meeting, which was held at the Palace Hotel, opened, the activity around the registration desk gave full evidence that the sessions probably would set an attendance record for gatherings of that type. And later developments bore out that early indication.

Success which marked the sessions also attached itself to the exposition of mining equipment and supplies which found more than 50 manufacturers displaying their products to the assembled mining men, with the United States Bureau of Mines and nine states also being represented by exhibits.

All sessions were featured by fullest possible attendance, with the round-table discussions and the meetings dealing with technical subjects being "jammed," to use the descriptive word employed by one observer who reviewed the meeting soon after the final blow of the gavel.

PROCEEDINGS

A full account of the proceedings of the meeting held at San Francisco, September 24-29, by the Western Division of the American Mining Congress, will appear in the November issue of The Mining Congress Journal.

Taxation so heavy as to threaten the incentive to produce was cited as a major danger confronting the mining industry.

The meeting heard the prediction that the coming session of Congress probably will see strong moves made to impose additional tax burdens.

Together with taxation increases, the growing costs of unemployment insurance and workmen's compensation were discussed. Though there was absolutely no tendency to minimize humanitarian aspects of the picture, those who indulged in comment upon these subjects pointed to the stifling influence which the constant increases of a variety of mining costs are exerting. It was pointed out that these mounting costs reduce the industry's opportunity to place its products upon the market at prices which invite purchase. And unless the products are purchased, it was pointed out, neither capital nor labor in the mining industry can hope for anything more than mere "existence."

Speakers pointed to the necessity of lifting an emphatic voice against "dangerous and unsound" policies, and the need for modification of the securities act was emphasized.

Rehabilitation of the mining industry, it was declared by W. Mont Ferry, chairman of the program committee, in an address delivered early in the meeting, would put 1,000,000 persons—or 10 percent of the unemployed—back to work.

The speaker stressed the fact that the Federal Government is paying slight attention to the nation's second industry. His statements, which were the basis for expansion of expressions during the meeting, centered upon the fact that the mining industry has been receiving "step-child treatment."

Among the speakers who addressed the meeting were noted Government figures, including Senator Key Pittman, Senator Patrick A. McCarran, and Director Finch of the United States Bureau of Mines. The substance of their remarks and the remarks of other speakers will be presented in the next issue of this publication.

Apart from the work-a-day aspects of the meeting, the hundreds of persons who attended gained much convenience and pleasure from the earnest and diligent work of members of the committee of arrangements and the program committee.

Following registration and the official inspection of exhibits, the opening day of the meeting witnessed a luncheon meeting at which delegates met Howard I. Young, president of the American Mining Congress; W. S. Boyd, chairman of the Western Division; W. Mont Ferry, chairman of the program committee; and J. F. Callbreath, secretary of the American Mining Congress.

At the first afternoon session, following appointment of the resolutions committee, the meeting heard addresses by W. Mont Ferry and Senator Pittman. In the evening, a reception was held in honor of President Young.

Technical meetings and round-table discussions marked the morning of the

(*Concluded on page* 30)

Accident Experience and Cost in Virginia Coal Mines*

By JOSEPH F. DAVIES † and H. B. HUMPHREY ‡

FOR THE period covered by this report (1929 to 1932), Virginia ranked eighth in the amount of coal produced each year among 24 coal-mining states. The standing of Virginia in relation to the others according to its accident record is shown in table 1. The close relation between the percentages of total production and fatalities given in this table show that normally the fatalities in the coal mines of Virginia are average in number for the amount of coal produced.

Virginia's production is slightly less than that of Alabama and a little more than that of Colorado. Both of these states have a better fatality record than Virginia; and, although Colorado's injury rate is somewhat greater than that of Virginia, Alabama's is very much lower. No close comparisons can be drawn between any particular states on the basis of accident rates alone. Hazards may differ greatly, so that a good record in one case may reflect naturally advantageous conditions and in another effective accident-prevention methods. However, where wide differences in rates appear between states producing over a million tons, the reasons should be sought and corrective measures taken to save lives and reduce mining costs. Among the 16 states having a record better than the average for the United States as a whole, Alaska, Michigan, and Texas each produced less than a million tons.

The depression is evident in the decreased number of mines, tonnage produced, operating time, and men employed. Consistent reduction in accidents would have given the states a good record in 1932, had there not been 54 deaths from mine explosions. This improvement was accomplished by real cooperative effort of the officials and men of several leading companies, and state and national agencies interested in accident prevention in coal mines. The greatest factor in bringing about the improvement was the very noteworthy progress made by three large companies. Their record is given in table 4 and that of the others in table 5.

TABLE 1.—FATAL MINE-ACCIDENT RECORD OF VIRGINIA COMPARED WITH THAT OF THE 24 COAL-MINING STATES

Year	No. of fatalities Va.	No. of fatalities U. S.	Percentage of Total production	Percentage of Total fatalities	States having Greater no. of fatalities	Deaths per million Man-hours Va.	Deaths per million Man-hours U. S.	Tons Va.	Tons U. S.	States having lower frequency rate
1929.....	43	2,187	2.1	2.0	8	1.78	1.87	3.37	3.59	12
1930.....	46	2,063	2.0	2.2	8	2.43	2.06	4.22	3.84	17
1931.....	31	1,463	2.2	2.1	6	1.81	1.82	3.19	3.31	15
1932.....	71	1,168	2.2	6.1	4	5.70	1.80	9.20	3.29	22

Accident costs are shown in table 8. The average time lost from compensable temporary injuries was 48.3 days, and from noncompensable lost-time injuries, 4.1 days. The average for all temporary lost-time injuries was 30.9 days. Apparently the average time lost per temporary injury varies slightly from year to year, with no particular trend. The change from five to three days lost from noncompensable injuries is based on the change from a ten-day to a seven-day waiting period in June, 1930.

The cost of compensation per fatal accident in any year varies according to the average number of dependents, and has ranged from $2,400.30 in 1929 to $2,988.97 in 1931. Compensation for permanent partial disabilities averaged $498.18 per case, decreasing from $534.65 in 1929 to $421.60 in 1932. This cost for 1932 may be increased by additional awards to open cases on future developments. The cost of compensation for temporary disabilities has not varied much from the average of $46.11 in any year. The average compensation per nonfatal compensable injury was $88.26.

Total compensation costs for fatal accidents averaged $138,625, and for nonfatal accidents, $153,900, making an average yearly total of $292,525. Medi-

TABLE 4.—ACCIDENT RECORD OF THREE LARGE COMPANIES SHOWING GREATEST IMPROVEMENT IN ACCIDENT REDUCTION

Year	No. employed percent of Va. total	Tons produced percent of Va. total	Lost-time injuries Number	Lost-time injuries Percent of Va. total	Accidents per million Tons	Accidents per million Man-hours
1929.....	45	47	1,005	40.7	172	86
1930.....	44	46	664	33.2	131	75
1931.....	43	45	444	27.6	103	59
1932.....	39	44	203	18.3	63	44
Total or average.....	43	45	2,316	32.2	127	71

TABLE 5.—ACCIDENT RECORD OF 40 OTHER COMPANIES

Year	No. employed percent of Va. total	Tons produced percent of Va. total	Lost-time injuries Number	Lost-time injuries Percent of Va. total	Accidents per million Tons	Accidents per million Man-hours
1929.....	55	53	1,465	59.3	225	105
1930.....	56	54	1,335	66.8	225	119
1931.....	57	55	1,169	72.4	221	118
1932.....	61	56	900	48.7	220	123
Total or average.....	57	55	4,869	67.8	223	114

* Extracted from *U. S. Bureau of Mines Information Circular* 6763.

† District engineer, U. S. Bureau of Mines, Norton, Va.

‡ Assistant mining engineer, U. S. Bureau of Mines, Norton, Va.

TABLE 8.—COST OF ACCIDENTS, 1929-32

Description	1929	1930	1931	1932	1929-32
Fatal plus non-fatal:					
Number	2,471	1,999	1,613	1,103	7,186
Cost:					
Compensation	$330,236.00	$305,029.00	$250,589.00	$284,243.00	$1,170,097.00
Funeral and medical (est.)	87,960.00	79,481.00	68,255.00	51,317.00	287,013.00
Total direct	418,196.00	384,510.00	318,844.00	335,560.00	1,457,110.00
Ave. compensation cost	133.64	152.59	155.36	257.70	162.83
Ave. medical cost	35.60	39.76	42.31	46.52	39.94
Ave. total direct cost	169.24	192.35	197.67	304.22	202.77

cal costs were estimated from the available data, since several companies provide such service themselves and no figures were given. These estimated costs agree closely with those given in some similar reports on other states. (See appendix.) The average total funeral and medical cost of all fatal and lost-time injuries per year was $71,753, or $39.94 per case. The combined total direct costs averaged $364,278 a year, or $202.77 per lost-time injury, including fatalities.

Direct accident costs considered in this report include medical, hospital, funeral, and compensation charges. The indirect costs are more intangible, but usually include the following items:

1. Time lost by injured employe.
2. Time lost by other affected employes.
3. Injury to property.
4. Loss of production.
5. Continued overhead.

The estimated costs of the indirect losses to the employer due to an accident are approximately four times the direct costs, according to H. W. Heinrich, of the Travelers Insurance Co. On this basis the average indirect cost of accidents to the operator in Virginia coal mines is $1,457,110 per year and the total cost $1,821,388.

The average direct cost of accidents in Virginia coal mines is approximately 3.6 cents per ton, and the total cost therefore would be about 18 cents. These costs are high enough to indicate plainly why accident prevention should be fostered and studied by every group connected with the industry, aside from the humanitarian obligation. This cost must come out of profit; therefore all employes, as well as the management, have a vital interest in accident reduction. Considerable reduction in accident cost and frequency can be made with little or no expense other than sincere cooperative efforts by the management and employes.

Gold Mining Operations in Northern Virginia

(*Continued from page* 16)

The operations now in progress are entirely exploratory. The objective of the operators may be said to be the determination of commercial possibilities of the sulphide orebody at depths which as yet are unknown. The management is seeking a large tonnage of low-grade ore sufficient to justify milling operations.

The present surface plant, adequate to carry forward the proposed exploration and development work, includes an office, in which are the drafting, surveying, bookkeeping and other office records, equipment and supplies; a small modern assay office adequate to handle all mine and (proposed) mill samples; a comfortable change house equipped with showers, lavatories, and lockers; a tool shed and blacksmith shop; a framing shed; and a power house, all new and modern and lighted by electricity. The power plant comprises a 630 cubic foot air compressor powered by a 125-horsepower Caterpillar Diesel engine, a 42-inch ball-bearing type drum hoist powered by a 60-horsepower Wauckshow engine, an 8,000-foot, ⅞-inch, long twist, non-rotating wire rope (cable), and 27 cu. ft. capacity hoist buckets. Drilling is done with 2 screw-teeth Worthington drills using ¼-inch steel.

Every modern device for the comfort, convenience and safety of employes, both underground and on the surface, has been provided. The shaft is equipped with portable cluster lights. Blasting is conducted by modern safety control methods, using relay detonators and shooting a round of 18 holes for each round.

About 40 men are now employed, working on three shifts of eight hours each. Since the labor is local farm labor, the men live at home, on near-by farms, and no bunkhouses have been built at the mine.

The Culpeper tract, in Culpeper County, about 1½ miles northeast of the Melville mine, is also held by the Paul G. Benedum interests. Preliminary field examinations of the property have been made, and it is reported that as soon as explorations at the Franklin are more definitely advanced, similar work will be begun on this property. The same interests are said to be investigating other tracts in the general Wilderness-Franklin area and may possibly add other properties to their present holdings for further future exploitation.

North American Mines, Inc.

North American Mines, Inc., reported to be composed of Boston capitalists, have recently acquired the property of the old United States mine near the old United States ford, on the Rappahannock River, in Spotsylvania County. The mine is about 15 miles west of Fredericksburg and about 12 miles, via dirt road, from the Fredericksburg-Culpeper highway (State Route No. 3).

This is one of the oldest properties in the region and was operated prior to 1837. In 1836 it was reported by Silliman to be producing $600 per week, and was said to have then employed a force of 40 to 50 men. The vein, which was said to be a quartz vein in schist carrying sulphides of iron, copper, and lead, was reported to be 7 ft. wide and to often show free gold. Stamps and Chilean mills were used to crush the ore and amalgamation was used to recover the gold.

New explorations are now in progress under the direction of Mr. Spencer Hutcheson, Jr. A new headframe, 20 to 25 ft. high, has been erected at the site of the former shaft, and the old shaft is being cleaned out, reconditioned and deepened.

New equipment now on the ground includes a small Ingersoll-Rand portable utility hoist and bucket, and a large Ingersoll-Rand portable compressor. A tool shed, framing shed, and blacksmith shop have been constructed.

It is the intention of the operators to thoroughly explore this property to test the probable commercial development value of the sulphide zone beneath the older workings.

References

Lonsdale, J. T.; geology of the gold pyrite belt of the northeastern Piedmont, Virginia: Virginia Geol. Survey Bull. 30, 110 pp., 1927.

Nitze, H. B. C., and Wilkens, H. A. J.; gold mining in North Carolina, etc.: North Carolina Geol. Survey Bull. 10, 1897.

Silliman, B.; Culpeper gold mine in Virginia, *and* remarks on some gold mines and parts of gold region of Virginia, etc.: Am. Jour. Sci., Ser. 1, vol. 32, 1837.

Taber, Stephen; geology of the gold belt in the James River Basin, Virginia: Virginia Geol. Survey Bull. 7, 271 pp., 1913.

Watson, T. L.; mineral resources of Virginia: Virginia - Jamestown Exposition Commission, Lynchburg, Va., pp. 549-567, 1907.

CORRECTIONS

AN APOLOGY is extended to Dr. Frank L. Hess, of the United States Bureau of Mines, who prepared and submitted the very interesting chart on the Production and Prices of Tungsten used in illustrating the article on "Developing the American Tungsten Industry" in the September issue of THE MINING CONGRESS JOURNAL. Through error, credit was not given the United States Bureau of Mines for their cooperation in this instance.

IN OUR August issue we presented an article "A Modern Coal Preparation Plant," by C. H. Spencer and erroneously gave his company affiliation as Westinghouse Electric and Manufacturing Company. Mr. Spencer is with Roberts and Schaefer Company. We regret the error.

Costs In Relation To Mining†

By CAREL ROBINSON *

IN STUDYING coal company cost statements to find the facts, one of the most difficult and elusive items is "MAINTENANCE." At a great many mines, especially during the recent years of depression, the plant, equipment and machinery has been allowed to deteriorate. Development was stopped, airways and haulways were not maintained in condition for proper use. Bad order mine cars were simply eliminated from service and machines were dismantled for repair parts to keep other machines operating. In a great many cases this procedure was necessary and wise to conserve cash, just as it was necessary to renew rates and delay paying certain accounts.

While maintenance was deferred very much the same as the payment of accounts was deferred, they were treated differently on the books. Expenditures for labor and purchases were carefully recorded as items entering into costs whether the payments were made or deferred, but maintenance expense that was deferred was not recorded. Hence it was reflected in a showing of cost that was lower than actual. As a result of this the sales and plans were based on inaccurate information and costly mistakes resulted.

While in many cases it was necessary to defer maintenance, there were other cases where it was done simply in order that the management could make a better showing according to the books. With salaries and promotions based in part on such records, there has been removed one incentive for efficient work, and there has been put forward a temptation to sacrifice the property for personal gain. By way of illustration I will refer to a mine which, in association with Stuart, James & Cooke of New York, we reported on several years ago.

This mine was producing approximately 3,000 tons a day and at costs approximately equal to the lowest in the district and a little lower than the average in the district. The capable and experienced general manager was displaced by a man from the Sales Department who promised to show a substantial reduction in costs though he had only a limited experience in mining. This manager made good his promise and according to the cost statements he reduced the operating costs nearly five cents a ton lower than the best in the district. Sales and financial plans were made with the low costs as a basis and with the expectation that the production of 3,000 tons per day could be maintained.

Unfortunately the production could not be maintained and output was gradually reduced until it was a little less than 2,000 tons per day. This was not sufficient to meet the minimum royalty payments and we were called in to report on the enterprise.

We found that the maintenance had been deferred to such an extent that nearly $90,000.00 would be required to put the operation into condition to produce 3,000 tons per day at a competitive cost. The new manager had produced a little less than 600,000 tons of coal. Thus for every ton he had produced it was found that the company must pay 15c to put the mine, the equipment and machinery back into proper condition. Instead of saving $30,000.00 he actually cost the company more than $60,000.00.

With improved business during the past few months the effect of "Deferred Maintenance" has been felt acutely by many companies. Production capacity was found to be less than expected and delivery could not be made of coal sold. Managers and superintendents and foremen are being condemned for failure to produce and for excessive costs above the amount that can be accounted for from wage increases and reduced hours of work. Part of the increase is the result of fact that the plan and equipment and machinery is in a rundown condition and part is from the fact that to meet demand for increased production expenditures are being made for items of maintenance that had been deferred.

Earnest, capable men are forced to make explanations that sound like alibis because the books show an increase in costs and without anything in the record to show for the expense.

A few days ago I happened to be present in a conference where the general superintendent was "on the carpet" because of an increase in his track costs compared with costs with the same production in 1931, and greater than could be accounted for by the increase in wages. He was severely criticized.

Upon investigation it was found that for a period of nearly four years practically no ties were purchased for the main line tracks, and replacements became imperative. The engineer's budget for main line tie replacements for the mines called for an average of 320 ties per month but to make up for the deferred maintenance this general superintendent was installing approximately 1,000 ties a month. Thus his expense for this item more than threefold normal cost. The predecessor superintendent had gotten credit for cost which he had not earned and the present superintendent was condemned improperly. Now superintendents are as human as other people and I know this one is tempted to defer other items of maintenance which is against good operating practice but which will help his present cost and make him more secure in his job.

For a great many years in different districts, I have been interested to see the efforts of mine officials to maintain a uniform cost. One favorite method was in times when production was high and

(*Concluded on page* 38)

* Div. General Supt., Kelly's Creek Colliery Co.

† Paper presented to Annual Coal Convention, 1934.

Homestake Mining Company

— ELLISON SHAFT —

Skip-Cage Changer

By DARELL P. AYER *

AT the Ellison Shaft of the Homestake Mining Company, Lead, S. Dak., one hoist is used to operate either skips or cages. This necessitates daily interchanging, for which the patented apparatus described herein was constructed and placed in successful operation.

This shaft, now operating to the 3,200-foot level, accomodates two hoisting units, No. 1 Hoist operating two, seven-ton capacity, ore skips interchangeable with two double-deck cages, and No. 2 Hoist operating one large double-deck cage for men and material in balance with a counterweight. In the arrangement of the shaft the No. 2 large cage compartment occupies the entire north area, the two No. 1 skip compartments occupy the remaining west area and are designated North and South Skip Compartments; the No. 2 counterweight occupies space directly east and in the rear of the North Skip Compartment; the remaining easterly part of the shaft is divided for pipe and cable compartments and manway. All cage landings at the shaft collar open to the west directly under the ore bins into which the ore skips dump.

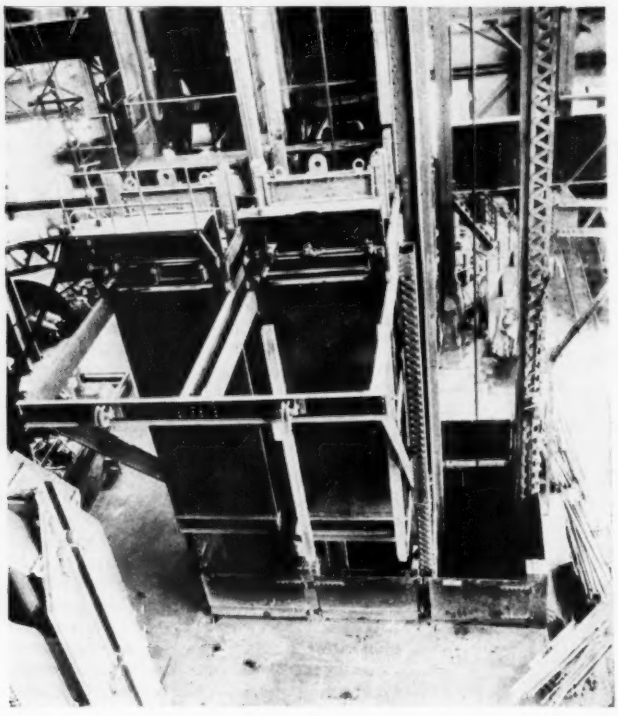
Present ore hoisting requirements of the No. 1 Hoist are approximately 6 hours per 24-hour day. This service starts after the night shift crews of the mine have been lowered and the cages removed and the skips installed. Upon completion of the ore hoisting the skips are removed and the cages again installed for shaft service.

Overall dimensions of the ore skips are 5 ft. 3 in. x 5 ft. 4 in. x 15 ft. high, weight 12,870 lbs. each; of the double-deck cages 5 ft. 3 in. x 5 ft. 4 in. x 18 ft. high, weight 8,000 lbs. each.

The design of the apparatus for transferring these skips and cages permits their installation in or removal from the vertical shaft line of travel in normal position with a minimum amount of horizontal travel. When the skips are in service the cages are held in the carriers on the west side or front of the shaft directly under the ore bins and when the cages are in use the skips are retained in the carriers on the east side or rear of the shaft over the manway and pipe compartments.

The carriers, one for each skip compartment, are installed directly below the skip dumps in the head frame, and when the cages are retained in them there is an 8 ft. clearance between the bottom of the cages and the floor of the landing.

* Chief clerk, mechanical department.



Skip-Cage Changer

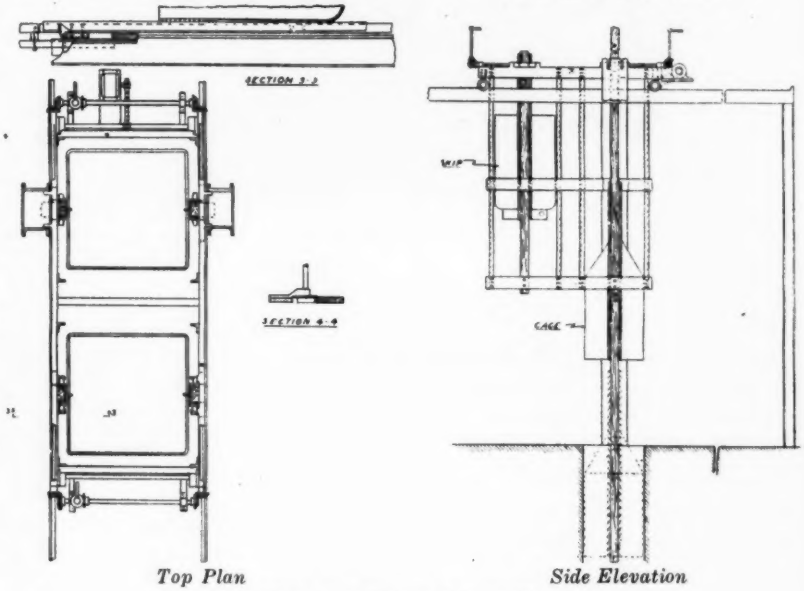
Referring more particularly to the construction of the carrier or transfer crane, the body is made of steel bars and consists of two side members joined together by end members and a center or intermediate cross member. The center member divides the body into two compartments, the east for the ore skip and the west for the cage. This body is supported by axle boxes secured at the corners through which are journalled axles; on the axles are steel wheels which run on steel rails appropriately supported by the steel structure of the head frame. Dependent from the body are steel hangers and horizontal connecting beams which provide a rigid frame that extends downward from the body a distance slightly greater than the height of the guide runners of the cage. Secured in vertical position in each compartment of the body and rigid frame are sets of standard sized wooden guides which are placed to mate unerringly with the fixed guides above in the head frame and the fixed guides below in the shaft when the carrier has been driven forward or backward across the shaft the required distance. Chairs or dogs arranged in pairs are secured on each side of each compartment to the top of the body side members and by means of hand operated journalled shafts and sets of beveled gears are rotated forward and backward. When turned forward alongside the guides they are adapted to receive lugs secured on the outside of the skip or cage guide runners thus retaining the skip or cage in the carrier; when rotated upward and backward the chairs pass into slots in the structural steel guide posts thus locking the carrier from horizontal travel on the rails. The carrier is driven along the rails by a 5 hp. 13 rpm. electric, reversible, gear motor, secured on a bracket at the west end on the carrier body, the power is transmitted by a chain drive, the chain running over a sprocket wheel on the gear shaft of the motor and a sprocket wheel on the west axle, speed of travel 21 ft. per minute, distance traveled by carrier to displace either skip or cage 7 ft. 5½ in.

The inside dimensions of the carrier compartments are such as will permit the free passage of the skip or cage except when the chairs are forward. The outside dimensions of the entire apparatus permit of its travel across the shaft without interference with other shaft structures except the No. 2 counterweight hoisting rope which is, as stated above, directly in the rear of the North Skip Compartment and must be displaced before the ore skip can be taken out of or into the line of vertical travel. To permit the free passage of this carrier the No. 2 counterweight is raised into the head frame above the apparatus. To accomodate the raising and lowering two additional sets of guides are carried by this carrier, one set between the cage and skip compartment and one set on brackets at the east end; these sets of guides mate with upper and lower fixed guides of the counterweight compartment and are spaced to bring proper alignment when either the cage or skip carrier guides register with their proper set of fixed guides. Clearance required by the counterweight in passing through the carrier is allowed in the body and frame. The overall dimensions of the counterweight are 8 in. thick, 4 ft. 8 in. wide and 11 ft. 2 in. high, weight 14,400 lbs.

Fixed platforms installed just above the required clearances of the carriers permit of the operation of push button controls of the electric drive motors, and rotation of the chairs and the changing of the hoisting rope from the one elevation.

In operation the interchanging of the ore skip and cage with this mechanism is accomplished in the following manner: With the cage operating in the shaft and the ore skip removed, the cage is raised by the hoisting engine into the carrier frame, the channel guides of the cage sliding up upon the set of guides in the cage compartment, until its lugs are above the chairs permitting the chairs to be turned out of the slots, thus unlocking the carrier and placing the chairs in the line of travel of the lugs. The cage is then lowered and the lugs come to rest upon the chairs. The hoisting rope is disconnected from the cage and the carrier driven forward until the cage is completely removed from the shaft. The carrier is stopped when the ore skip is brought over the shaft and the guides of the skip compartment are in line with the fixed guides. The hoisting rope is attached to the skip and the skip raised by the hoisting engine until the lugs on the skip are lifted above the chairs in the ore skip compartment. Such chairs are

(*Concluded on page* 28)



Top Plan *Side Elevation*

Ayer Mine Shaft, Ore Skip and Cage-Changing Device

Accident Prevention and Safety at Mascot, Tennessee

By P. M. ARTHUR *

YEARS ago, Mascot, like a great many other mining communities, gave very little attention to safety or to the prevention of accidents. This attitude was mostly due to thoughtlessness, and was more or less of an individual problem with each superintendent or foreman, and unfortunately not all of these leaders knew what safety was all about. So when concentrated efforts were put forth by industry, it was not such a problem after all to sell the safety idea.

Gradually a universal safety movement began to take effect, and management realized that the loss of life and injuries to employes was one of the major responsibilities confronting industry. Not only human loss and suffering had to be stopped, but the dollar loss was increasing production costs. Not until a realization of this and direct orders from management that safety and the prevention of accidents had to go hand in hand with production, was there a turning point and positive reduction in accidents.

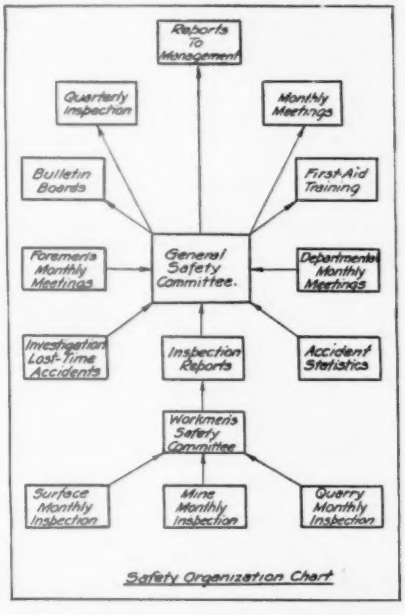
Each industry had its different angles of promoting safety and the reduction of accidents. For that matter, where a certain safety program could be successfully carried on at one plant, the same program might not work even in a similar industry. So management had to be alert on safety measures, and if the program or method in use did not obtain results, changes were necessary in order to put over the safety idea.

General Safety Committee

The Mascot safety organization, chart of which is shown, consists first of a General Safety Committe around which all accident prevention functions. The personnel of this committee consists of operating department heads, superintendents, or foremen, and at the present time is composed of six men. This committee serves for three months, and the members are rotated so that any program inaugurated by one committee can be properly carried on by the next committee. The only member of the committee who serves continuously is the director of personnel. These committees are chosen by the management at the beginning of each year, designating the chairman for each quarter. From experience we have found that a committee of six functions best.

* Director of Personnel, American Zinc Co.

Monthly inspections are made by the General Safety Committee, of both underground and surface operations, three members of the committee making the underground inspection and three making the surface inspection. Reports



Safety Organization Chart

are made by this committee showing all unsafe practices found, and copies of these inspections are sent to all department heads whose duty it is to immediately correct the unsafe practices and report back to the General Safety Committee that the suggestions have been complied with, or their reasons if the suggestions cannot be followed. By this method all delays are prevented.

The General Safety Committee also meets regularly to discuss safety, review accident statistics and outline any new ideas or methods for the prevention of accidents.

A committee of at least three members of the General Safety Committee personally investigates all lost time accidents immediately following the accident. Reports of these investigations are posted on all departmental bulletin boards. These investigations show the cause of the accident, place the responsibility and make suggestions for improvements to avoid a similar occurrence.

There is also a monthly meeting known as the foremen's safety meeting that is attended by the General Safety Committee, all department heads and assistants and foremen. These meetings are presided over by the chairman of the General Safety Committee. It is the intent of these meetings to broaden the scope of the General Safety Committee by discussing problems in all departments and to familiarize the foremen with any new safety ideas, as well as to bring to the General Safety Committee's attention unsafe practices or any new thoughts the larger group may have.

The General Safety Committee makes a complete report to the management at the end of each quarter covering the activities of the committee. In addition to this report the management is furnished with copies of all accident statistics, inspection reports, minutes of meetings and anything pertaining to safety.

Departmental Safety Meetings

Monthly departmental meetings are held by each department, and although these meetings are primarily safety meetings, some operating problems are also discussed. These meetings are held during work hours on the job and are attended by from 10 to 30 employes. A man is appointed at each meeting to act as chairman for the following meeting, and the personnel at these meetings is rotated so that all men in each department have an opportunity to attend. Minutes are kept of these meetings and copies are furnished all department heads so if there are any suggestions of unsafe practices they can be corrected promptly. It has been our experience that more real safety suggestions come from these departmental meetings than from any other source, as the men feel free to discuss unsafe practices that they hesitate to call to the attention of their foremen or to the General Safety Committee.

Workmen's Safety Committee

Monthly safety inspections are made by workmen safety committees, both underground and on the surface. These committees are chosen by department heads, three men to serve on each committee. By changing these committees each month, new men are continually being trained on safety methods, as well

as being given the opportunity to express their ideas on safe and unsafe practices. These committees make written reports of their inspections and copies are sent to all department heads who in turn issue orders to correct the unsafe practices reported.

First Aid Training

First aid has always been considered an important factor in our safety work. First aid not only trains men to take care of their fellow workers in case of accidents, but by knowing first aid, employes are aware of the consequences of accidents and thus become safer workers. In the early days at Mascot no effort was made to train all our employes in first aid, but a certain number were trained each year for inter-department safety meets, and from time to time teams competed in state and sectional meets. In recent years our employes have been trained under the United States Bureau of Mines Cooperative First Aid Training, and for the past three years we have been awarded certificates for 100 percent cooperative training.

Bulletin Boards and Saffety Education

In order to reduce accidents and improve safety records, every employe must be interested. A certain amount of work can be done by management, superintendents and foremen, but to accomplish real results in safety we believe that every man on the job must be sold on safety. Therefore, in addition to the influence that supervision has on the men, other means of reaching them are necessary. This can be accomplished by use of bulletin boards, safety literature and competitions.

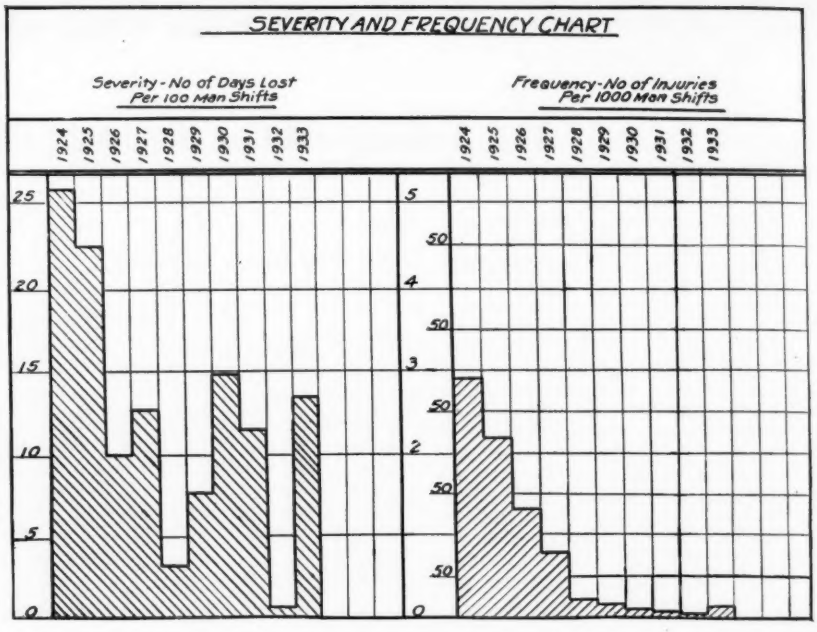
Each department has bulletin boards located at points where all the men have occasion to pass, and large three-panel boards are located at central points such as the plant entrance, mine entrances and pay office. Various bulletin services have been used from time to time.

In addition to the bulletin services, we use payroll inserts, safety calendars, foremen safety training services and monthly safety pamphlets are distributed to all employes. Awards are given for departmental safety achievements, and all of this stimulates and keeps up the safety thought.

Safety Rules

Each employe is given a Safety Rule Book in which is set out not only how to work safely at the different occupations but what not to do. Employes are told in the Safety Rule Book where the company requires goggles to be worn, on what jobs hard-toe shoes are required and also where protective hats are to be used.

Our present mine rules require every man going underground to wear an approved safety hat. Each underground man must have a pair of goggles as part of his equipment, and he is also required to wear approved safety shoes.



While the use of gloves is not compulsory, we recommend their use in certain occupations.

Accident Data

Considering the period of 10 years, 1924 to 1933, the total number of employes at Mascot averaged 512—the lowest number in any one year being 418, and the maximum of 616 occurred in 1929. During this period the severity rate (days lost per 100 man shifts) in 1924 was 25.8 as a maximum, and .58 in 1932 was the minimum. Frequency rate (injuries per 1,000 man shifts) had a maximum of 2.89 in 1924 and a minimum of .076 in 1932. During the first nine years the frequency rate shows a gradual downward trend—however, in 1933 a slight increase occurred. The severity rate, although from a very high mark in 1924 to a fairly low rate in 1932, was more or less up and down, and in order to give this more vividly, a curve is shown of the severity and frequency rates. From the year 1925 to 1933 the reduction in lost time accidents was 96 percent.

Homestake Mining Company

(*Continued from page* 26)

thereupon free to rotate upward and backward into the slots again locking the carrier. The set of guides in the cage compartment have been removed with the cage and the set of guides in the skip compartment have been brought into service by this operation. The ore skip is now ready to ascend or descend. The removal of the skip and installation of the cage is the reversal of this operation.

For complete repairs and overhauling of the skips and cages they are removed and taken to the blacksmith shop. To permit of their removal from the carriers the steel rails upon which they travel are of such length as will allow the entire apparatus to be driven entirely clear of all shaft structure on the east side of the shaft. Directly above this position installed upon a 12 in. I beam is a 12,000 lbs. capacity electric hoist and trolley which lifts the cage or skip of either compartment out of the carrier and lowers the unit onto the landing floor.

Daily cleaning, oiling and inspection of the skips and cages are made while they are out of service. Inspection and oiling of the carriers are attended to once each week. Operation of the apparatus is done by the regular shaft crew and requires about five minutes for the complete change.

THE TOTAL QUANTITY of slate sold in 1933—exclusive of granules and flour—amounted to 73,240 short tons, a drop of only 17 percent compared with 1932, but the value declined 20.5 percent to $1,515,863. The quantity of roofing slate sold increased 6.1 percent, from 144,410 squares in 1932 to 153,170 squares in 1933. The value, however, delined 9.8 percent. Total mill stock sales in 1933 dropped 26.4 percent in quantity and 36 percent in value from 1932. Sales of electrical slate and school slates increased in both quantity and value, but all other mill stock registered declines. Sales of slate granules and flour dropped 11.1 percent in quantity from 1932, but only 1.5 percent in value.

Some Safety Standards

For Metal Mining†

By D. HARRINGTON*

IN A PAPER as brief as this one must be it is impossible to give anything like an adequate idea of safety standards desirable for the operation of metal mines in the United States. Therefore, it will be confined to a relatively few suggestions with respect to underground mining that might be termed unusual. The recommendations are not intended to supersede the requirements of existing laws or regulations which stipulate higher standards or which cover the scores of items which cannot be mentioned in a short paper. Some of the recommendations are novel and others will probably be interpreted as being too drastic, but they are offered as the result of more than 30 years of study on safety in mining and, if they were adopted throughout the metal mining industry, they would unquestionably aid materially in removing it from its present status of having one of the worst accident records among the major industries of the United States.

All officials of mines should be familiar with federal, state or local laws and regulations as to health and safety in and around mines, as well as with the health and safety rules of the company, and should enforce them to the best of their ability.

Every mine should have available printed or multigraphed rules, preferably in pocket, pamphlet form, specifying the operating company's minimum safety requirements at the mine. Specific instructions (in as many languages as may be necessary) should be given in this pamphlet to every class of mine labor, including foremen, shift bosses, safety men, miners, drivers, hoistmen, trackmen, timbermen, electricians etc., as well as to the various types of surface workers, in order to convey both to the officials and to the workmen the minimum requirements of the company as to health and safety. With these minimum requirements as a starting point, others may be added from time to time or be issued verbally.

Every mine should have a staff of officials sufficient to make at least two inspection trips daily to every working place in the mine, with plenty of time to make a careful safety inspection of the place and to make certain that unsafe conditions or practices are remedied without delay. In general, there should be fewer than 50 underground employes for each supervisory official.

Preferably, all superintendents, foremen, safety inspectors, or bosses of any kind in charge of underground workers should have a certificate of competency and in general these certificates should be issued by the state after the applicant has passed a rigid examination showing that he is competent to perform the duties of his position. If the state does not issue certificates, the examination and certificate should be made by the operating company. The certificate should expire after five years from date of issuance and should be renewable only upon again passing a rigid examination to determine whether the holder is keeping informed on up-to-date policies and methods in the operation of mines in a safe and healthful manner.

Every underground mine should keep in a safe and quickly accessible place on the surface a record which shows the time when each person goes into the mine and when he comes out, and which also shows, in so far as practicable, where he may be found while in the mine.

Every mine or mining plant employing 25 or more persons should have a full-time safety man or at least one whose main function is safety work. He should preferably have technical training and several years experience in mining, should have authority to require immediate execution of safety instructions, and preferably should be employed by and report to the highest company officials. One of his duties should be to train or to have trained every person in and around the mine or plant in an up-to-date course in first aid to the injured and to see that every person in the organization keeps well trained in first aid. The safety man should make a safety inspection and written report on the mine at least once a month; the report should contain summarized conclusions and recommendations, and a copy should be sent to the highest operating official of the company as well as to the mine foreman or superintendent; preferably the report and its recommendations should be discussed in the safety meeting following the date of the completion of the report.

Every mine should have an actively functioning safety organization with meetings at least as often as once a month, which all bosses should be required to attend; there should also be periodical safety meetings at which all employes should be in attendance.

Workers in mines should be made acquainted with the state laws and regulations as to safety as well as the company's safety rules—and should obey them. Failure to obey state safety laws or regulations or company safety rules should subject the offender to prosecution by the state or to discipline by the company, or both.

Every person employed in or around any mine should take the United States Bureau of Mines full course of training in first aid to the injured.

Protective wearing apparel, such as hard hats, gloves, goggles, safety shoes, etc., should be worn where the occupation is of such a nature that specified equipment or apparel is known to be advantageous in the avoidance of accidents or ill health.

For the protection of the employe and the employer as well as for the best interest of the general public, every person employed in or around any mine should before employment, and annually after employment, undergo a complete physical examination under methods and conditions which will insure that the data thereby obtained are used only for the forwarding of health and safety.

Every feasible effort should be made to reduce the amount of dust in the air of underground places and faces to an absolute minimum in all kinds of mines. Also, in so far as feasible, men should not be required to work where there is an excessive amount of water.

Every mine should have a mechanically controlled ventilating system with the main intake air course in a separate opening from the return air course, and with the main ventilating fan located preferably on the surface and so installed that the direction of air can be reversed with little or no loss of time.

† Published by permission of the Director, U. S. Bureau of Mines. (Not subject to copyright.)

* Chief, Health and Safety Branch, U. S. Bureau of Mines, Washington, D. C.

Preferably the man-hoisting or traveling mine opening or openings should be on intake air. Every mine should be so ventilated that the air of working places shall at all times be kept free of gases, dust, temperatures, and humidities dangerous to safety and health. Explosive gas (methane) should not be permitted to exceed 1½ percent, oxygen should be maintained at not less than 19 percent and carbon dioxide should not be allowed to exceed 1 percent. No appreciable percentages of poisonous gases, such as carbon monoxide, hydrogen sulphide, etc., likely to be found in fumes from blasting, should be allowed, and provision should be made to have a sufficient quantity of pure circulating air to keep dangerous quantities of finely divided dust from the air breathed by workers and, if possible, to maintain temperatures below 80° F. (and if possible below 75° F.), especially if relative humidity is above 90 percent. There should be at least 2,000 cu. ft. of air per minute passing through every working place, and preferably past every working face.

While driving tunnels or drifts and sinking or raising shafts or slopes, and also in their operation, there should be an adequate ventilating current wherever men work or travel.

Openings into abandoned mines or parts of mines should be adequately sealed or protected against entrance of persons or animals, or to prevent contamination of the air of working parts of mines. Exceptions may be made to this requirement in order to allow of ventilation or escape through abandoned mines or parts of mines.

Every underground mine should recognize the danger of even a small underground fire and should have plans made, and on record in typed or printed form, as to procedure in case of fire at various places in the mine, but with particular reference to procedure in case of fire in combustible structures at or near the collar of the main hoisting shaft or in the shaft itself in a shaft mine.

All shafts and all inclines with pitch greater than 30 degrees should have along or in them a system of fire doors such that by closing doors the shaft or incline can be isolated from any or all levels or other openings leading to or away from the mine workings.

All underground mines should have a system of fire doors so placed as to be capable or isolating practically any main working section of the mine in case of fire. All mines should have an underground water system with suitable arrangement for prompt and efficient use in case of occurrence of fire in any part of the mine.

Internal-combustion engines should not be used underground, and certainly should not be used in any part of a mine (or in tunnels under construction) unless the velocity of the air current in the place is more than 100 lin. ft. per minute and toxic gases are always kept less than 0.02 percent in the air current, and also unless the percentage of inflammable gas in the air current is less than 0.25 percent.

All mines should establish and announce to employes in printed or other similar manner a systematic method of timbering suitable to the individual mine, defining the minimum spacing of supports and allowing for additional supports where necessity for them is seen. There should be readily available at all times to all working places an ample supply of the necessary sizes and lengths of timber to keep working places safe; mine timbering should preferably be done by well-qualified full-time timbermen.

At every entrance to every shaft there should be a strong, tight gate or door, which closes automatically and is always kept closed except when the cage or skip is at the opening; the door or gate should be so constructed that it will prevent men or material falling into the shaft.

Blasting should not be done during the working shift, because it throws into the air enormous quantities of finely divided dust as well as considerable amounts of poisonous gases and some explosive gases, and because, in addition, it has a definite tendency to heat the surrounding air. Places in which blasting is done should be thoroughly wet down previous to firing the shots and also immediately upon returning to the face after the shots have been fired; in general, unless ventilation is very effective, it is inadvisable to return to the face in less than an hour after blasting. Preferably, blasting should be done by or under the immediate supervision of a shot-firer having a certificate of competency indicating that he is expert in the handling and use of explosives.

Preferably, mine cars should be of solid type as to sides, ends, and bottom, and no cracks, holes, or other places for leakage of material from mine cars should be allowed.

Electrical equipment used in and around mines or mining plants should be of the inclosed, nonarcing or permissible type wherever feasible, should be installed in a safe, careful manner, and kept in good repair. All bare power lines carrying 100 or more volts in or around mines or mining plants should be adequately safeguarded throughout their entire length against contact by persons or animals wherever they are less than 7 ft. above the floor or footwall or the rail.

All moving parts of mechanical equipment used in or around mines or mining plants should be kept adequately guarded and all such equipment should be kept in good repair.

Adequate lighting should be provided at all places where men work; preferably the portable lights for underground workers should be permissible electric hand or cap lamps, and no open lights or smoking should be allowed.

Every underground mine and every part of every mine in which 10 or more persons work should have two or more ways of escape to the surface, so arranged and equipped that men can escape quickly. Where the mine exits are shafts or inclines with pitch greater than 45 degrees, there should be man-hoisting arrangements in at least two openings if the depth is greater than 300 ft.

All accidents in and around mines and mining plants should be reported to an appropriate governmental agency, and a carbon copy of every accident report should be forwarded to the United States Bureau of Mines.

Conclusion

Every mine has its individual conditions which require specific types of procedure if the health and safety of the workers are to be protected as they should be or if the property itself is to be safeguarded from loss or even from destruction. Custom and common sense dictate many safety practices in mining, state or local laws usually have numerous safety provisions for the operation of mines, and a few have at least some requirements looking to the safeguarding of the health of the mine workers. The up-to-date mining company looking to the avoidance of accidents and ill health to employes as well as to the dollar-and-cents dividends which accrue to the operator by preventing employes' accidents and ill health, has in effect in its mines safety and health practices far in advance of those required by law or even those well known to the greater number of those engaged in mining.

Metal Convention and Exposition

(*Continued from page* 21)

second day of the meeting, with the afternoon session being featured by the report of the resolutions committee and programmed addresses. The third and fourth days held the same general and interesting tone, with the annual dinner being given on the evening of September 27.

On September 28, presidents and secretaries of all western mining organizations conferred for the development of a ways and means committee to most effectively utilize the results of the deliberations which had marked the course of the meeting.

Resolutions which received attention of the meeting included those dealing with the following subjects:

Use and stabilization of silver as money complimentary to gold throughout the world; development by the Federal Government of debris storage dams to aid hydraulic mining; tariff protection of the domestic copper industry; amendment of the present capital stock tax law; expression of sympathy and regret in connection with the death of Ludwig Vogelstein, chairman of the board of the American Mining Company; exemption from the silver purchase act's provisions of silver not brought to a marketable state as a refined product on August 9, 1934, and certain other related exemptions; recommendation of endorsement of President Roosevelt's efforts in assistance of creating a larger production of gold.

MINING EVENTS

Silver and Gold

MID-SEPTEMBER ESTIMATES of the amount of Silver being turned into the Treasury following the naturalization order indicated surrender of only a quarter of the silver in the United States.

Slowness with which newly-mined silver is moving toward the government's possession is indicated by figures which show that only 11,712,000 ounces had been purchased from the date of the executive order to buy all newly-mined silver at 64½ cents (December 21, 1933, to August 31, 1934).

Interesting facts relating to silver have been gathered by the Wall Street Journal in connection with an analysis of silverware manufacturers.

Higher prices are anticipated by many silverware manufacturers, this analysis indicates. Manufacturers are quoted as expressing an opinion that the activities of the Administration at Washington, coupled with other factors, probably will be instrumental in bringing about an increase in the current world price of 49¼ cents an ounce for the white metal.

"The trade is not of one mind," the study continues, "as to the effect of the recent naturalization of silver. Some manufacturers state it has proven advantageous in that the wide publicity given the metal has made people more silver conscious and has increased the metal's 'precious' and 'luxury' appeal."

Also, there is seen an appreciable aid in stablizing the inventory position of the industry. In some instances, it is declared, companies with substantial stock have been able to show a sizable advance in the value of their holdings.

"There is a good possibility," the survey continues, "that in the future manufacturers will be dependent upon foreign sources for their supplies unless the government chooses to sell some of its current holdings in the event of a rise in the world price.

PRODUCTION OF SILVER throughout the world declined almost 1,000,000 ounces during June, according to the current monthly report of the American Bureau of Metal Statistics. Production is well above last year, however. Total output for the world during June is estimated at 15,193,000 fine ounces, compared with 16,131,000 in May and 11,575,000 in June, 1933.

The decline was due principally to a sharp drop in Canadian output from 1,543,000 ounces in May to only 963,000 in June.

In addition to the decline in Canadian production was a 274,000,000 drop in the estimated Mexican figure for June. The preliminary estimate places June output at 6,800,000 fine ounces compared with 7,074,000 in May and 5,067,000 in June, 1933.

Mines in the United States showed a slight increase at 2,312,000 fine ounces, compared with 2,303,000 in May and 1,209,000 in June, 1933.

Production throughout the world has increased sharply in the first six months of this year as compared with the corresponding period a year ago. Total world output for the first six months amounted to 89,504,000 fine ounces, compared with 79,350,000 in the like period last year. Among the three major producers, Mexico has increased its output to 37,859,000 fine ounces from 33,967,000, the United States to 13,723,000 from 11,442,000 and Canada to 7,325,000 from 6,008,000.

NOW, HE'S DONE IT!

—San Francisco Call Bulletin

The Bureau is now able to report Japanese production which is estimated at 550,000 fine ounces for both May and June, compared with the high this year of 611,000 in April. Current estimate compares with 514,000 in January, 532,000 in February, 577,000 in March, and 570,000 in December, 1933.

WORLD SILVER PRICE improvement recently has resulted in efforts to reopen the famous "Descubridora de San Felipe" mine, near San Felipe Aconcagua, Chili, according to the United States consul report to the Commerce Department. The mine has been closed 43 years but from 1850 to 1891 is said to have produced $40,000,000 in silver. The reports are that the ore at that time ran as high as 40,000 grams of silver to the metric ton. Deaths in the owner's family stopped work in the early nineties. Recent geological work indicates a main lode ore body of 63,000 metric tons, assaying 720 grams to the ton, the Consul reports. The property is said to contain four main veins and others have been found, it is said. Chilean experts estimate it will take 1,200,000 Chilean pesos ($48,000) to reopen and operate.

MODERN MACHINERY installed for placer operations on the streams of Montana is being credited with doing work which would have required the energies of 8,000 men working by hand methods used in "the good old days."

Placer operations in that state today are being conducted on a scale approximating that which characterized the great Alder Gulch boom, which saw millions of dollars worth of gold washed from the streams in the Helena district. But, because machinery so largely has supplanted the efforts of individuals, much of the old "boom-time" color and obvious activities of a large number of men is comparatively lacking, say reports from the field.

On Indian Creek, near Townsend, a giant dragline is digging as much gravel as could be handled by a crew of 700 miners working by hand, one report to the *Denver Mining Record* states. Whereas the hand miners could dig to a depth of only a few feet, the dragline is going down to bedrock, whether that be 2 feet or 30 feet below the surface.

Approximately 25,000 yards of gravel is being washed daily on the streams of Montana, and that record was maintained as an average during the last six months. It is possible that this daily average may be doubled next year if additional equipment is brought into the field as contemplated.

The advent of large-scale use of machinery, however, has not caused a disappearance of the oldtime type of placer miner in the section. A recent survey revealed that, in addition to the machine placer mining in Montana, there were at least 800 individual placer miners washing out gold in shallow diggins, some of them using tractors and small shovel equipment, while others stand faithful to the use of picks, shovels, and sluice boxes.

TWO COMBINED quarterly chapters of the *California Journal of Mines and Geology* are announced by Walter W. Bradley, state mineralogist, as ready for distribution. These two chapters of the State Mineralogist's Report XXX are combined in a single issue which is essentially a revision, enlarged and brought up to date, of the placer-mining bulletin issued in April, 1932. It is on sale for 80 cents per copy, plus 10 cents for shipping charges, and may be purchased through the office of the California State Division of Mines, Ferry Building, San Francisco, or through the district offices in Los Angeles, Sacramento, and Redding.

Under the title of "Elementary Placer Mining in California, and Notes on the Milling of Gold Ores," the information is detailed under the following subheads: Types of Placer Deposits; Simple Placer Mining Equipment; Pan, Rocker, Dip Box, and Sluice Box (with sketches for construction); Special Machines and Processes (in which are described, with a large number of photographs and plans, some 200 separate appliances, machines, or processes); Dry Washing; Black Sand Treatment; Marketing Gold, Platinum, and Black Sand; Placer Mining Areas in California (a brief outline of localities, with a map); Mining Laws (a brief summary); Prospecting for Vein Deposits; Sampling of Vein Deposits; Milling of Gold Ores (outlines of principal methods); Hand Sorting; Amalgamation; Arrastre Construction and Operation (illustrated); Other Reduction Mills; Gravity Concentration; Flotation; Cyanidation; and concluding with a selected bibliography both on milling and placer mining. The bulletin covers nearly 200 pages and is well illustrated both from photographs and drawings.

THE NATIONAL RECOVERY ADMINISTRATION announced that the secondary aluminum industry Code Authority has submitted modifications of its code to provide for a budget and the basis of contribution by industry members. It also seeks termination of the exemption in Administrative Order X-36, under which firms are freed from contributing to expenses of any code except that covering their principal line of business.

The total amount of the proposed budget is $17,460. The basis of assessment is 50 cents a net ton of finished secondary aluminum and its alloys, this to be paid monthly on shipments of the previous month.

Notice was given that any criticisms or information relating to the action of the Code Authority were to be in the hands of Deputy Administrator W. A. Janssen before September 24.

Copper

THE FACT THAT more than $2,000,000,000 of PWA allotments not yet has really begun to exercise influence upon industrial construction, leads to the belief in well-informed quarters that buying in the domestic copper market may pick up somewhat during October and November. It is noted, incidentally, that recent construction figures show a tendency toward higher levels.

FIGURES relating to copper stocks in North and South America show a decrease of 14,250 tons during August, while stocks elsewhere increased 26,750 tons. The total for production of copper from ores and secondary material during August is 26,750 tons, as compared with a corresponding figure of 86,250 tons produced from ores and secondary materials abroad. Apparent consumption figures for the month were set at 30,500 tons in the United States and 77,750 tons abroad.

THE NON-START FLIGHT RECORD

—The Chicago Daily News

In this connection, there has been an expression of the belief that the sudden stop in foreign buying of copper, which occurred some time ago abroad, means that consumption of copper in Europe actually was markedly less than the shipments of the earlier months of 1934, caused many to think. This view was set forth a few days ago in the columns of the *Wall Street Journal*, with the following additional comment:

"This sudden pause in foreign buying has its significance just as much as did the sudden pause in domestic buying of copper that followed the large buying of copper in the domestic market preceding the advance in price to 9 cents. Both were periods of marked temporary overbuying brought in by artificial developments. Thus the present asking and selling prices of the foreign producers has no more significance than had the 18-cent pegged price of some years ago."

R. R. ECKERT, Sales Clearing Agent for the Copper Code Authority, has given notice to outside holders of copper that they may participate in supplying from stocks 6,191 tons of copper, which were sold in excess of sales quotas on June 11, 12, and 13, at an average price of 8.561 cents per pound, under a plan to be formulated by the Code Authority.

As the stocks in United States are understood to now be slightly in excess of 400,000 tons, these releases from stocks will amount to about 1½ percent, or 1½ tons on every 100 tons held, providing all holders agree to participate in the liquidation in accordance with the stipulations fixed by the Code Authority. In the first place, these provide that holders of copper furnish the Sales Clearing Agent, not later than August 8, a statement of unsold stocks of copper as of June 1 (including undelivered purchases) segregated as to grades, brands, shapes and locations, together with statement as to the tonnage which holders wish to file as basis for the current allocation. Secondly, it provides that those holders who elect to participate in this allocation from stocks will be required to participate in all future allocations subject to the proviso that no member of the industry shall be required to accept allocations which would reduce his stocks held and unsold on March 1, 1934, by more than 25 percent.

Section 8 of Article VII, of the Code of Fair Competition for the Copper Industry, provides:

"After the sales quotas of the current month and next two months have been sold, further sales during the current month shall be allocated to and applied to copper stocks; provided, however, that prior to a general allocation to copper stocks there shall first be set aside fifty percent (50%) of all sales then to be allocated to copper stocks, which fifty percent (50%) shall be divided so that two-fifths shall go to secondary producers in proportion to their respective holdings of secondary copper accumulated since October 1, 1933, but limited in any event to such accumulations, and three-fifths to by-product and other primary stocks, and then the remaining fifty percent (50%) (or whatever larger amount there may be available pursuant to the foregoing) shall be allocated to copper stocks generally and not to sales quotas. The Code Authority shall propose a plan for the handling of such allocations to stocks generally which shall be effective when approved by the Administrator, and which shall provide for the disposal of such accumulations by an orderly liquidation, and such sales from stocks shall be Blue Eagle Copper within the meaning of this code."

According to this, the secondary producers and the holders of by-products and other primary stocks are allowed to participate up to 50 percent in supplying copper sold in excess of sales quotas, and therefore the general holders of copper will probably be allowed to furnish from their stocks only about 3,100 tons of the 6,191 tons that were oversold just prior to, and during, the advance in the price of Blue Eagle Copper from 8.50 cents between June 11 and June 13.

The text of the letter was as follows:

COPPER CODE AUTHORITY
26 Broadway, New York

July 30, 1934.

Gentlemen:

Sales of copper in excess of current sales quotas have been made as follows:

	Tons	At base price, per lb.
On June 11.....	5,307.568	8.501c
On June 12.....	688.278	8.947c
On June 13.....	195.638	8.843c
	6,191.484	8.561c

These excess sales will be allocated to stocks in accordance with the provisions

of the Executive Order approving the code for the copper industry.

If you are a holder of stocks of copper, you will be entitled to participate in such sales to the extent and in a manner to be provided in a plan to be formulated by the Code Authority and effective when approved by the Administrator. In order to formulate such plan, it is necessary that you furnish the Sales Clearing Agent with the information called for in the attached form, to be in his hands not later than August 8, 1934.

The price of 8.561 cents above named is for standard brands and shapes (i. e., electrolytic and/or prime lake copper, not only in accordance with the specifications of the American Society for Testing Materials, but of grades, brands and shapes which are readily acceptable to buyers of copper for fabrication into copper products, copper wire, or brass) based on delivery at fabricators' plants in the Connecticut Valley, and is subject to such differentials as may be necessary to adjust for other grades, brands, shapes or points of delivery.

Under the Executive Order approving the code for the copper industry, if you elect to participate in the allocation of sales from stocks, you will thereafter be required to participate in all future allocations of sales from stocks, subject only to the following proviso: "In no event, however, shall any member of the industry be required to accept allocation of sales made pursuant to the Sales Plan which will require him to reduce the amount of copper stocks held by him and unsold on March 1, 1934, less stocks liquidated by such member since that date, by more than 25 percent thereof, but no such limitation shall apply until the Code Authority receives notice from any such member of the industry that further sales will require him to reduce his stocks beyond that percentage."

Please report promptly.

Very truly yours,

R. R. ECKERT,
Sales Clearing Agent.

The following is the form to be used by copper holders in furnishing the Sales Clearing Agent with the information required:

Dated .....

R. R. Eckert, Sales Clearing Agent,
Copper Code Authority,
26 Broadway, New York City.

Dear Sir:

In answer to your letter of July 30, we wish to advise you as follows:

(1) The tonnage of our unsold stocks of copper as of June 1 (including undelivered purchases) was..... ——

(2) The tonnage we wish to file with you as a basis for the current allocation to stocks is..... ——

(3) The segregation of the tonnage reported as item (1) above as to grades, brands, shapes and size and locations is as follows:

Tons	Grades and brands	Shape and size	Location—plant, refinery or warehouse
.....	.....	.....	.....
.....	.....	.....	.....

We hereby advise you that we wish to participate in allocation from stocks to the extent of all or any part of the tonnage reported on line 2 above, in accordance with whatever plan is approved by the Administrator.

WE REPRINT herewith a statement on the Copper Code agreement, published in *The American Metal Market.* The Copper Code Authority has publicly released the communication it addressed to all consumers of copper under date of July 27, submitting the suggested form of a permanent buying agreement, to replace temporary buying agreements already entered into, together with a set of hypothetical answers to the questionnaire sent out by the Code Authority on July 7, and an explanation of their application of the proposed permanent buying agreement. The communication read as follows:

To all members of the Copper and Brass Mill Products Industry, members of the Wire and Cable Subdivision of the Electrical Manufacturing Industry and other consumers of lake and electrolytic copper;

Attached hereto is a proposed form of Permanent Buying Agreement.

There is also attached a set of hypothetical answers to the questionnaire sent out by us on July 7, 1934, and an explanation of their application to the Proposed Permanent Buying Agreements. The examples given represent rather extreme cases and are given to clarify the situation in your mind. We would appreciate it if you would analyze your situation, fill in the blank spaces on the Proposed Buying Agreement, and forward them to us.

This Agreement is submitted to you after consultation with members of your industry and consideration of the matter by the Code Authority of the Copper Industry.

The almost universal acceptance of the Temporary Buying Agreements and the response to the questionnaire sent out on July 7 indicates not only a willingness but a desire to cooperate in making the terms of the Copper Code effective.

We feel that the successful operation of the Copper Code is dependent upon the continuance of this same spirit and the form of Permanent Buying Agreement which we are submitting herewith is designed to simplify the procedure in carrying this out. It is, we believe, in simple form and provides adequate protection both for you and for the copper industry.

In regard to purchases, it merely provides for an agreement on your part to purchase a certain percentage of your new sales commitments and an estimate of what this tonnage will involve with the right to make changes and cancel the agreement if the changes you suggest are not satisfactory.

In making your proposal we trust you will keep in mind the purposes of the Copper Code and the Executive Order approving it, which provide in effect that all consumers of copper will be urged to buy as large a proportion of their current requirements from new production and freeze as large a proportion of their stocks as possible.

In order to provide sales to clear the book currently, it is estimated that this will require purchases on the part of consumers of from 75 percent to 85 percent of their requirements.

It is also essential that in so far as possible, purchases be made in uniform monthly quantities.

Upon receipt of your proposal, we will go over it carefully and get in touch with you promptly.

Thanking you for your prompt attention, we are,

Yours very truly,

COPPER CODE AUTHORITY.
H. O. KING,
Managing Director.

New York, July 27, 1934.

SUGGESTED FORM OF PERMANENT BUYING AGREEMENT

Copper Code Authority,
26 Broadway, New York City.

Gentlemen:

We desire to qualify all copper sold and/or fabricated by us as "Blue Eagle Copper" in accordance with the Order approved by the Copper Code dated April 21, 1934. In compliance with said Order and in consideration of the benefits we derive therefrom we agree:

First—That we will cooperate with you in making effective the applicable provisions of the Copper Code and the Executive Order approving the same.

Second—That we will neither purchase nor fabricate on toll any copper other than "Blue Eagle Copper."

Third—That in order to adjust our purchases of "Blue Eagle Copper" from the effective date of the first sales period—namely, March 22, 1934—we will purchase ..... tons of "Blue Eagle Copper" upon the acceptance by you of this agreement.

Fourth—That beginning with the month of ....., 1934, we will purchase at least .. percent of the copper required for our new sales commitments. We estimate this will require the purchase on our part of not less than ..... tons per month. It is our understanding that we may purchase not only our requirements for the then current month, but at our option, for any part of the three succeeding months. This agreement is made on the express condition that at least ..... tons of "Blue Eagle Copper" per month will be made available for purchase by us at the filed prices effective on the date our orders are placed in accordance with the foregoing purchase agreement.

In the event we desire to change this agreement with respect to the percentages and tonnages involved and such changes are not acceptable to you, we may cancel this agreement.

It is understood that this agreement and your approval thereto in the form attached constitutes the entire agreement between us and that neither the Code Authority nor any member thereof

shall become or be liable in any way for failure or refusal to approve this agreement or any future modification thereof and that in case of a failure to reach a satisfactory agreement with the Code Authority our recourse is limited to an application to the Administrator as provided in the Executive Order approving the Copper Code.

This agreement shall remain in effect for a period of four months after approval hereof, unless cancelled or modified in writing in accordance with the provisions hereof, and thereafter may be renewed on such terms as may be agreed upon as satisfactory at that time to us and to the Code Authority or the Administrator.

(Signed) .....

By .....

APPROVAL

The Code Authority has approved the above agreement as satisfactory to it and so long as this agreement remains in effect and the terms thereof are complied with, you are privileged to certify all products fabricated and sold by you as containing only "Blue Eagle Copper" in accordance with the Executive Order approving the Copper Code dated April 21, 1934.

COPPER CODE AUTHORITY.

....

Managing Director.

Company A.—This company has no free stock and has not purchased scrap in making its product, using only lake or electrolytic copper. It has purchased only 600 tons of copper since March 22, 1934, and is short of its requirements.

Its indicated consumption is 600 tons of copper per month and to comply with the purposes and intent of the Executive order approving the Copper Code should make immediate purchases of 2,400 tons and start purchasing 100 percent of its new sales commitments in July.

For the purposes of easy understanding this is arrived at as follows:

EXAMPLES OF ANSWERS TO THE QUESTIONNAIRE OF JULY 7, 1934

	A	B	C	D
1. Stock of copper on hand March 22, 1934, made up as follows (If figures not available for March 22, 1934, please give April 1 figures):				
A. Normal in process stock on hand in mill necessary for operation	1,500	1,500	1,500	1,500
B. On hand or contracted for to cover sales commitments	1,000	1,000	1,000	1,000
C. Free stock on hand available for use or sale	0	0	5,000	5,000
Total stocks	2,500	2,500	7,500	7,500
2. Copper content of new sales commitments made March 22 to April 30, inc.:				
April 30	1,500	1,500	1,500	1,500
May 1 to May 31, inclusive	500	500	500	500
June 1 to June 30, inclusive	1,000	1,000	1,000	1,000
3. New copper purchased March 22 to June 30, inclusive (please list purchases in tons, dates and name of supplier)	600	5,500	0	3,000
4. Copper content of scrap purchased from March 22 to June 30, inclusive	0	500	0	500
5. Our average monthly consumption of copper for the 12 months period ending June 30, 1934, was	600	600	600	600
New copper	600	480	680	480
Scrap	0	120	0	120

	A	B	C	D
Company should immediately purchase following tonnage	2,400	0	2,250	0
Permanent buying agreem't should start in following month.	July, '34	Feb., '35	Aug., '34	Jan., '35
And cover following percent of new sales commitments.	100	80	75	60
And indicate purchases of the following tonnages	600-800	480-640	450-600	360-480

Company B.—This company has no free stock except as covered by its large surplus purchases of copper made since March 22, 1934.

It has purchased 6,000 tons of new copper and scrap since that date, enough for its requirements at the rate of 600 tons per month for 10 months or until February, 1935.

Its average consumption of new copper and scrap was 600 tons per month as follows: 480 tons of new copper and 120 tons of scrap. As it had no free stocks on March 22, 1934, it is reasonable to suppose therefore that this company would want to purchase 80 percent of the copper content of its new sales commitments or from 480 to 640 tons.

Company C.—This company has a large stock of copper on hand on March 22, 1934, and has made no purchases of copper since that date, presumably using its stock on hand to fill its sales commitments.

It has not been in the habit of purchasing scrap and therefore in line with its expressed desire to purchase 75 percent of its new sales commitments of

Sales period	Indicated requirements	Purchased	Should purchase now	To purchase *
No. 1—March 22 to April 30	800	600	200	
No. 2—May 1 to May 31	600	...	600	
No. 3—June 1 to June 30	600	...	600	
No. 4—July 1 to July 31	600	...	600	
No. 5—August 1 to August 31	600	...		100%
No. 6—September 1 to September 30	600	...		100%
No. 7—October 1 to October 31	600	...		100%
No. 8—November 1 to November 30	600	...		100%
No. 9—December 1 to December 31	600	...		100%

* Percentage of new sales commitments.

This company under the buying agreement would therefore with its immediate purchase bring its purchases up to date and in August could buy either 100 percent of its requirements that month or any part of its requirements for September, October and November. Should it purchase in August its requirements or these succeeding months, it could in September purchase its requirements for December or could purchase these at any time from September 1 to December 31, inclusive.

All purchases to be made at the existing price of copper at the time the actual purchase was made.

3,000 tons or 2,250 tons, and beginning in July—purchase 75 percent of its new sales commitments or between 450 and 600 tons per month for the first three sales periods.

Company D.—This company also had a large stock of free copper on March 22, 1934, and in addition has made substantial purchases of new copper and scrap since that time. It also has in the past used approximately 80 percent of new copper and 20 percent of scrap in its plant.

Therefore in line with its expressed desire to purchase 75 percent of its requirements of new copper, it should purchase 60 percent of its new sales commitments arrived at as follows:

One hundred percent less 20 percent for scrap equals 80 percent.

Seventy-five percent indicated purchases of from 360 to 480 tons per month.

However, as this company has purchased 3,500 tons of new copper and scrap since March 22, 1934, and has in effect anticipated its requirements for roughly 10 months, it should not purchase any new copper until November and then only for its February requirements of 60 percent. Those February requirements could be purchased at any time from November 1 to February 28, 1934, and subsequent requirements on the same basis.

Lead

AUGUST witnessed the first decrease in smelters' stocks of refined lead that has occurred during 12 months, according to figures which became available late in September. The reduction for the month, as shown by the statistics issued by the American Bureau of Metal Statistics, was approximately 6,300 tons.

The improved statistical position, comments the *American Metal Market*, was brought about partly by a reduction in output and partly by an increase in shipments. The month's shipments were the largest since January, 1934.

The August production of 27,300 tons was divided 23,000 tons from primary sources and 4,300 tons from secondary sources, the former showing a decline of 4,300 tons from July and representing the smallest production since August, 1933. As no curtailment in mine output has occurred, it would seem that the smaller production has been due to unannounced restriction in smelting operations which, in recent months, have been running at an excessive rate as compared to shipments. Recovery from scrap in August showed little change from July.

Of the 4,100-ton increase in shipments, 2,600 tons were credited to the battery

trade whose requirements appear to have increased about 50 percent in August over July. Lead foil needs recovered to the monthly average requirements shown for the first five months of this year increasing, incidentally, from only 100 tons in July. Ammunition demands, which averaged only 700 tons monthly during the second quarter of the year, increased to 1,600 tons in August as against 1,200 tons in July. For the eight-month period, January to August, shipments of lead to all lines totaled 241,000 tons as against 228,000 tons in the same period in 1933.

AMERICAN BUREAU OF METAL STATISTICS reports lead production in the United States during August totaled 27,328 short tons, as compared with 31,881 short tons in July and 25,016 short tons in August, 1933.

Domestic lead shipments during August totaled 33,606 short tons, as compared with 29,479 short tons in July and 36,054 short tons a year ago.

CORRECTED STATISTICS on zinc concentrates and lead concentrates for five weeks ending September 1 have been made available by the Tri-State Zinc and Lead Ore Producers' Association.

Figures on zinc concentrates show the total stock, sold and unsold, for each of the five weeks as follows: 15,638 dry tons of 2,000 pounds; 16,054; 17,619; 17,760; 18,887.

Corresponding figures for net reserve stock are: 14,647; 14,846; 16,194; 16,148; 18,477.

Volume of production for each of the five weeks is given as follows: 5,169; 6,959; 7,222; 7,888; 8,640.

Corresponding figures for shipments are: 6,037; 6,543; 5,657; 7,747; 7,513.

The total production during the five weeks' period is given as 35,875, while the total shipments for the same period is stated to be 33,497.

Production of lead concentrates during each of the five weeks is indicated as follows: 742; 810; 864; 1,021; 1,003, with a total of 4,400 for the five weeks' period.

Corresponding figures on lead concentrates shipments are: 592; 572; 565; 683; 795, with total reaching the figure of 3,207.

Iron and Steel

IN CONTRAST with August, when most of the steel companies were shipping more material than they were making, the latter half of September found several concerns producing more steel than they needed for delivery requirements. In summarizing the facts linked with this situation, the *Wall Street Journal* indicated this was due to a tendency to replenish depleted stocks in a few lines, in preparation for any possible late fall demand.

"The difference between production and shipments is narrow," the review continues, "and it is not likely that steel companies will expand their activities unless such a step is considered justified by the attitude of their customers. Therefore, any further increase in operations would mean that steel companies were actually feeling a better demand.

"Consumers, while taking more steel than they did a month or two ago, are not rushing the market, despite the fact that prices for fourth quarter have been reaffirmed in filings with the American Iron & Steel Institute. There is no difficulty for users to get material on comparatively short notice, and some consumers continue to hold back in the hope that prices may be cut slightly to attract buying.

"There are definite signs of improvement in heavy products, particularly structural steel. A number of good-sized inquiries are in the market on which bids will be taken in the next two or three weeks. Of course, it will be considerable time before mill operations are affected after orders have been placed. Nevertheless, good order books encourage the steel companies and the sentimental influence of these bookings will be felt. In the Middle West there has been an increase in structural mill operations; this has been a factor in the recent upturn in output.

"Railroads will not be in the market for some time, perhaps not until next year so far as rails or equipment are concerned. However, several carriers should become active within the next few weeks in covering for their fourth quarter requirements of bars, shapes, and plates. These tonnages, while not substantial individually, are important in the aggregate."

"YOU PADDLE AND YOU FLOAT, IN YOUR LITTLE WOODEN BOAT, AND YOU NEVER KNOW WHERE YOU ARE"

—The Washington Evening Star

THE CODE AUTHORITIES for administrative agencies under the code of the scrap iron, nonferrous scrap metals, and waste materials trade have proposed a change in the announced basis of contribution to code expenses. As a result the NRA announced that September 25, instead of September 17, as the time limit for filing objections, criticisms, or suggestions.

The basis of contribution originally suggested for members of the trade was one-twentieth of 1 percent of the gross volume of business. The new proposal would establish graduated assessments on business from $500,000 and less to $3,000,000 and more.

The proposed budgets and the agencies for which they were submitted followed:

Scrap iron and steel trade..... $50,140
Nonferrous scrap metal trade.. 56,350

Payments would be based on the gross volume of business for the calendar year preceding the date of assessment, in accordance with the following:

Gross volume up to and including $500,000, one-twentieth of 1 per cent.

Gross volume from $500,000 up to and including $1,000,000, one-twenty-fifth of 1 percent.

Gross volume from $1,000,000 up to and including $2,000,000, one-thirtieth of 1 percent.

Gross volume from $2,000,000 up to and including $3,000,000, one-thirty-fifth of 1 percent.

Gross volume from $3,000,000 and above, one-fiftieth of 1 percent.

No assessment would be less than $10.

AN ALLOTMENT of $200,000 to the Bureau of Mines, Department of the Interior, for construction of a new Bureau of Mines Experiment Station building at the University of Alabama, Tuscaloosa, was announced by Public Works Administrator Harold L. Ickes.

The experiment station, *serving* the important *coal* and *iron* industries of the southern states and nonmetallic *mining* and *quarrying* industries of the southern Appalachian regions, is at present housed in two inadequate buildings at the University of Alabama. Today's allotment will make possible the construction of a thoroughly modern mines experiment station structure.

A PROPOSED CODE for the iron ore mining industry was presented at public hearing before Deputy Administrator Walter A. Janssen. Protests against certain of the labor provisions, notably with respect to hours of labor and minimum wage rates, were made by representatives of the American Federation of Labor of the Labor Advisory Board of the National Recovery Administration.

The code was submitted by R. C. Allen, of Cleveland, Ohio, chairman of the code committee of the industry. In response to questions by the Deputy Administrator and representatives of the Labor Advisory Board, Mr. Allen said the Lake Superior Iron Ore Association, which sponsored the code, comprised about 92 percent of all iron ore producers in the United States, and that the membership produced about 60 percent of the total annual volume. He explained, however, that the association does not include the production of the United States Steel Corporation, that production being under the code for the iron and steel industry. The committee, he stated, had been in constant touch with all other producers in the preparation of the code, and 95 percent were sponsoring it.

W. C. Holden, representing the American Federation of Labor, testified that employment in the industry is approximately one-half of what it was in 1919, with the hours now being worked approximating only 30 per week. Therefore, he declared, there seemed to be no justification for week nearly so long as that provided for in the code. He recommended a maximum 30-hour week. Even this, he insisted, would not make a substantial increase in employment. He also recommended a penalty rate of time and one-half for all hours worked in excess of 30 per week and double time for Sundays and holidays.

Mr. Holden also protested against exception from the minimum hour provision made in the case of executives and those in similar capacities receiving $25 a week in the south, or $35 a week in the north. He said this provision would exempt a "host of workers" in a class where work is very essential. He also objected to the language of the section relating to "wages above the minimum," and said there was not an adequate definition of the meaning of "equitable adjustment."

J. A. Lipscomb, representing the *Labor Advisory Board*, entered a *protest* against the *differential* in the *rates of pay*. He declared there was no good reason why there should be a reduction in wages under the code from the wages currently paid. In this connection, he pointed out that in Alabama the code provides for a minimum wage of 27 cents, whereas the minimum rate now paid there is 30 cents an hour. Under recent working agreements in the south between employers and employes, he said, not more than 2 percent of the employes receive as little as 30 cents an hour, and that 2 percent is classified as subnormal.

The minimum wage apart from those mentioned, he declared, is around 40 cents an hour. Moreover, he said, there is not good reason for a wage differential in the various geographical regions. In the south, he stated, iron ore and coal mines in many instances are not more than two miles apart; while in the Lake Superior region the iron mines are sometimes several hundred miles from the smelters. The mines in the south, he said, are practically all "captive" mines, with very little commercial mining being done.

Mr. Lipscomb protested against the *hours* asked for in the code and objected that there was no provision in the code for the *adjustment* of *differences* between employers and employes. Mr. Lipscomb further *advocated* an *embargo* on the *importation* of *iron ore*, saying that about 10 percent of domestic consumption is brought from abroad. Deputy Administrator Janssen explained that authority to prohibit importation is contained in the law itself, and is not a matter for inclusion in the code.

Coal

RELATIONSHIP OF NRA to the coal industry was thrust into the limelight early in September by the wholesale resignation of the national code authority for the retail solid fuel industry.

This wholesale resignation found the code authority transmitting a letter in which NRA practices were bitterly condemned. The code authority, as it resigned, charged lackadaisical methods in enforcement of code provisions, and declared chiselers have been thus enabled to abrogate the code provisions with impunity.

While that development was sensation enough in its own right, another was seen as holding much more command for the attention of producers. A distinct trend toward establishment of a separate administrative body to deal with coal matters in a manner similar to that employed by the Petroleum Administrative Board, was seen. It was known to observers that the President and Secretary Ickes favor such a move and that the NRA probably would welcome with delight an opportunity to rid itself of the troublesome bituminous code.

The Hayden-Lewis bill of the last Congressional session, which sought to allocate production and indirectly fix prices is receiving the attention of Solicitor Margold of the Interior Department, and a new draft, acceptable to the Administration, may result for introduction and possible passage at the next Congress.

The trend is definitely toward a separate administrative body similar to that of the oil board in the petroleum field as a permanent fixture and possible saviour of the industry. Decision of the National Fuel Association at its forthcoming meeting here as to the future of the coal code may be a factor.

THE RECENTLY CREATED General Code Authority was placed in charge of the operation of the retail solid fuel industry code, by order of the National Recovery Administration. The order specified that this action was only temporary, and that the period of its control should be limited to the time required for the industry to elect a new Code Authority of its own in place of the original one which resigned.

This action was taken with the approval of all three NRA Advisory Boards, representing industry, labor and the consumer.

The General Code Authority, headed by Dr. Willard Hotchkiss, president of the Armour Institute of Technology, Chicago, was created to supervise operation of "basic codes," simplified pacts adopted by industries whose trade and labor problems do not require elaborate special regulation and organization of their own. Other members are deLancey Kountze member of the Industrial Advisory Board of NRA, and chairman of the board of Devoe and Raynolds Co., paint and varnish manufacturers; Father Francis J. Haas, member of the Labor Advisory Board, who has a distinguished record in labor mediation and social service; and Stacy May, member of the Consumers Advisory Board, and Assistant Director of the Rockefeller Foundation.

An additional member, familiar with this industry's problems is to be named to sit on affairs of this one code.

It was pressed into service on the retail solid fuel code by designation as "custodian" pending a new election. The general authority, as custodian, will be responsible for operation of the industry's national code offices, continuing the existing staff which did not resign with the authority members.

THE SECOND CONSECUTIVE week in which a sharp increase in coal production was noted occurred for the week ended Sept. 1. Total bituminous production reached 6,755,000 tons, a gain of 545,000 or 8.8 per cent over the previous week which in itself represented a more than 7 per cent gain over the week before. The total, however, is still far short of the 8,010,000 tons produced in the same week a year ago.

Anthracite production for the week ended Sept. 1, jumped far ahead of previous weeks' figures, recording a gain of 45.4 per cent over the previous week. Expressed in tons the rise was 343,000 tons to a total of 1,098,000 tons, which is not far short of the 1,234,000-ton figure of the corresponding week in 1933.

Bureau of Mines' "Distribution of Coal Shipments" bulletin for August showed that generally shipments declined sharply in July as compared with July, 1933. The trend was also mostly downward as compared with June and significant was the fact that the heavy movement of Lake Erie in the early summer had begun to slacken and shipments reached their peak much earlier this year than heretofore.

THE NATIONAL RECOVERY ADMINISTRATION announced its approval of the Trade Practice Complaints Committee for the western Pennsylvania subdivisional Code Authority of the bituminous coal industry.

Members of the committee include C. F. Hosford, Jr. chairman, formerly president of Butler Consolidated Coal Co.; R. Templeton Smith, vice president of the Pittsburgh Coal Co.; H. M. Wassum, vice president of the Henderson Coal Co.; M. W. McClane, president of the McClane Mining Co., and Clinton Block Coal Co.; W. D. Rankin, vice president of the Lincoln Gas Coal Co.

A LESS FAVORABLE fatality rate in bituminous coal mining during July, according to Bureau of Mines figures, becomes important in connection with the program undertaken by the American Mining Congress' special committee studying how the constantly decreasing appropriations for the Bureau has hampered its activities and opera-

tions for the Nation's second largest industry.

During the month of July, 96 deaths were caused by accidents in and about the coal mines of the United States, according to reports received by the U. S. Bureau of Mines from state mine inspectors of the various coal-producing states. As the production of coal during the month amounted to 28,723,000 short tons, the fatality rate (death rates are based on tonnage rather than on number of men employed) was 3.34 per million tons of coal produced. This rate (which is subject to revision) indicates a less favorable accident record when compared with June, 1934 whose revised rate was 1.99 and with July a year ago when the rate was 2.71.

Accidents at bituminous mines were responsible for the deaths of 81 men; this, with a production of 25,280,000 tons of coal, shows a death rate of 3.20 as compared with a revised rate for June, 1934, of 1.82 when 26,424,000 tons of coal were mined, and a rate of 2.54 for July a year ago when 29,482,000 tons were mined. The current rate of 3.20 for bituminous mines for July, 1934, is the highest recorded for that class of mines since December, 1932, when the rate reached 5.65 per million tons. However, in that month there were three major disasters in which 91 lives were lost, whereas, fortunately, no major disasters occurred during July, 1934.

The anthracite mines of Pennsylvania accounted for the loss of 15 lives during July, 1934, in the mining and preparation of 3,443,000 short tons of coal, thus giving a rate of 4.36 which compares with a revised rate of 3.11 for June, 1934, and 4.0 for July a year ago.

Records covering the first seven months of 1934, when compared with the similar period of 1933, show an improvement in the fatality rates for haulage, electricity, and gas and dust explosions. Increases, however, are shown in the rates for falls of roof and coal, explosives, machinery, miscellaneous accidents underground, and accidents on the surface.

AFTER TWO SUCCESSIVE weeks of gains in bituminous production, a sharp curtailment was noted for the week ended September 8, due largely to the Labor Day holiday. Total production was estimated at 5,920,000 net tons, a decrease of 835,000 tons from the 6,755,000 tons of the week before. The average daily rate of output was higher during the holiday week than preceding weeks.

Anthracite production also suffered during the week, dropping from 1,098,000 tons the preceding week to 852,000 tons. Production during the corresponding week a year ago was 1,019,000 tons.

INCREASED COAL PRODUCTION in Illinois during August is revealed by current statistics, showing 2,752,695 tons were mined during August, compared with 2,211,172 in July and 2,739,496 in August, 1933, according to the State Department of Mines and Minerals.

Total production during the first eight months amounted to 23,789,166 tons, against 21,288,600 in the corresponding period of 1933.

THE FORTY-SECOND ANNUAL meeting of the Illinois Mining Institute will be held at the Hotel Abraham Lincoln, Springfield, Ill., on November 2, 1934.

Two business sessions will be held, one in the morning and the other in the afternoon, with a dinner in the evening. The program committee is working diligently to provide a most interesting and up-to-the-minute program. A highly interesting talk on matters of vital interest to all who are connected with coal mining has been arranged for the evening dinner session.

For additional details, address B. E. Schonthal, Secretary, 59 East Van Buren Street, Chicago.

OH, GOODY! MAYBE JIM'LL GET OUT ONE FOR ME.
BOB LA FOLLETTE
POSTMASTER GENERAL IS AUTHORIZED TO ISSUE A SPECIAL STAMP AND THAT WILL BE ONE THING OUT OF GETTING SANTA CLAUS

—The Washington Evening Star

A REPORT by the Bureau of Foreign and Domestic Commerce states 7,256 tons of anthracite were received at Boston from Russia during the week ending September 15.

In addition to the 6,164 net tons of anthracite from Wales which previously had been reported, there were importations of 3,226 tons of anthracite from Wales and 4,220 tons of coke from England during the same week, both coming to Boston.

THE TOTAL PRODUCTION of anthracite, which includes colliery fuel, for the week ending September 15 was placed by Bureau of Mines estimates at 957,000 net tons.

This figure represents an increase, as compared with production recorded for the preceding week, of 105,000 net tons, or 12.3 percent. Production during the corresponding week of 1933 was recorded as 1,251,000 tons.

BUREAU OF MINES estimates of total bituminous coal production for the week ending September 15 set the figure at 6,900,000 net tons, which indicates an increase of 944,000 net tons above the figure for the preceding week. The corresponding week in 1933 saw a production of 24,253,000 tons.

Minerals and Metals in Australia and New Zealand

(*Continued from page* 11)

plant, making 50,000 tons a year, also considerable cadmium and zinc dust. Australia has lead-working plants and three large zinc-coating works for sheet and wire, but lead and zinc mining greatly depends on exports for its existence. The writer revisited Broken Hill and found mining going on to a depth of 2,000 ft., 100,000 tons a month being dressed by flotation, new machinery and rearrangement of plant under way, and general good feeling despite the rather low prices for lead, silver, and zinc. A central Diesel-engine power and air-compressing plant is an economic feature of the field. The trains of lead and zinc concentrates on their way to South Australia, Tasmania, New South Wales, and Europe are of interest. Broken Hill prospers in face of such drawbacks as metal prices, heat, drought, and dust.

New Zealand is practically without lead and zinc.

Tin.—Two thousand tons or less a year comes from New South Wales, Queensland, and Tasmania mines. Some of this is exported, but the new tin-plating works at Newcastle should consume most of the output. Two plants in Sydney smelt tin concentrates.

Scrap Metals.—Australians appreciate the collection, treatment, and use of scrap metals, but not to the extent of Americans. Per head of population, their scrap production and output of secondary metals is much less, judging by the investigation the writer made, although no official statistics are collected as by the United States Bureau of Mines. A works handling 1,000 tons of scrap a year was the largest seen in Australia; one handling 30,000 tons was visited in Pittsburgh some time ago. Japan scoured New Zealand for scrap wrought iron and steel, just as the writer was recently informed they are doing in our Southern States now.

Nonmetallic Minerals. — Building stones are plentiful in Australia and New Zealand, but the former has only small resources in arsenic, asbestos, barite, chromite, diatomite, fluorspar, gypsum, magnesite, and mica. Salt is abundant. Arsenic is now obtained in fair quantity from calcining concentrate from the important Wiluna gold mine, Western Australia. Oil structures are being drilled in Queensland, Western Australia, New Guinea, and New Zealand with little success. All oils and distillates are imported, mainly in bulk. The Commonwealth and New South Wales Governments are about to resume oil production from the 20,000,000 tons of shale in that state. This averages 100 gallons per ton, but the project is to treat only 500 tons a day, a fraction of Australia's needs in oils.

Costs in Relation To Mining

(*Continued from page* 24)

costs were correspondingly low. They made purchases of supplies and repair parts far in excess of current requirements. These were stored and held as a reserve to help cost at a later date when heavy renewals and repairs would be necessary or when current production tended to increase the production cost. Experience had taught these men that being able to show a more nearly uniform cost helped them with the executives of the company, though it was accomplished by an economic loss from investing in materials before they were needed.

Only a few days ago the superintendent of a moderate size mine asked my advice about spending about $750.00 a month for three months to clean up an entry and lay some track which he probably will not need this year. He brought out in conversation that he is now shipping on a special order which permits him to operate five days a week double shifting. The heavy tonnage has a favorable effect on cost. In addition to this, since his machinery and equipment is being double shifted, it is necessary for him to defer maintenances as far as possible. He anticipates that in a few months when the special order is filled and the demand for production is reduced that he will want to overhaul certain machinery and expend between fifteen hundred and two thousand dollars on this. He dreads the criticism which he anticipates when his operating cost shows an increase from this. He figured that he could avoid a jump-up in cost by having in process the other improvement program which he can stop when he begins making repairs.

To avoid the difficulty which he anticipates and at the same time avoid making expenditures now which are not now necessary, it was agreed that three cents a ton should be charged as a reserve for maintenance and made available when the repairs are made.

If provision is thus made currently for the maintenance that is being deferred, then the current cost statements will be more nearly correct and the local management will not be subjected to suspicion or criticism later when the expenditures are made.

As a general rule skilled men keep a constant check on the securities owned by a company and on the condition of receivables. This also applies to the conditions of accounts payable and when it will be necessary to make disbursements. This is considered necessary for the guidance of the executives. In a great many cases it will also be found a great help for the executives to have reasonably accurate knowledge concerning the condition of maintenance for its bearing on future capacity and to know when it will be desirable or necessary to make heavy be co-ordinated with an inspection or engineering service in such a manner that the physical aspects will be taken into expenditures for repairs or replacements.

In my opinion the accounting should consideration. If it is decided to defer certain items of maintenance, then a reasonably accurate estimate should be made of the amount and a record should be made of this in the cost. In like manner if heavy expenditures are incurred in order to make up for maintenance which has been deferred, then the cost statement should reflect this fact in such a manner that it will show in its true light along with the current cost of production.

When maintenance is deferred the man in charge of a mine should be given credit for conserving cash, for his backbone, ingenuity, and for other virtues which were brought into play; but his cost of production should include an item for the value of maintenance that had been deferred.

CORRECTION: *In publishing this paper in the* 1934 *Year Book on Coal Mine Mechanization, Mr. Robinson's company connection was erroneously given as the Hillman Coal and Coke Company.*

Bureau of Mines Committee Activities

(*Continued from page* 19)

reduced. The number of men receiving these instruction courses has dropped from an annual average of 100,000 to approximately 50,000, with some doubts existing that the latter total will be reached this year.

"While several States and the larger mining companies have understaken training programs of this general type, those familiar with the situation declare it remains for the Federal experts to coordinate the nation-wide efforts, to extend advances in the field of basic research, and to provide service for small companies.

"The experimental mine developed by the bureau as a means of studying explosions and their effects has been placed on a greatly restricted schedule which this year will permit its use during only a few weeks, at most. This mine, without counterpart in the world, has enabled the bureau's experts to conduct tests that could not be made in a commercial mine and which could not be conducted within the confines of a laboratory. Much of the credit for the decrease in number of mine explosions is attached to these unique experiments.

"Discontinuance of the health division's operations has brought an end to pioneering studies and to advanced investigations which already have resulted in elimination of many dangers to health of miners and employes in many other industries. Notable among these studies and investigations are those relating to the breathing of harmful dusts, the effect of high temperatures and humidity upon efficiency and health and the toxicity of gases encountered in mining and metallurgical establishments.

"Though the Bureau is the only Federal establishment designated by law to study use of industrial explosives, its work along this line now has been reduced to routine testing, with all efforts to devise new safety methods being discontinued.

"On the basis of official estimates, it is stated the number of fatalities in the coal mining fields alone has been reduced by more than 1,000 annually since the bureau began its safety operations, while an annual average of 50,000 nonfatal accidents in coal mines have been prevented during the 24-year period. Marked increases in safety of metal miners also are indicated.

"Activities under the safety program must be continued if they are to be fully effective, the report emphasizes. In this connection, stress is laid upon the fact that new "generations" of supervisors and employes must be given training and must be made familiar with safety practices as they enter the mining field."

BOOK REVIEW

Prospecting for Gold and Silver, *by Eros M. Savage.* 307 *pages, illustrated. McGraw-Hill Book Company, New York,* 1934. *Price,* $2.50.

ANOTHER of the many books, booklets, pamphlets and leaflets on gold (this one also on silver) published since gold has become so profitable for search and recovery from gravels and ores. Thousands of copies of publications on gold have been given free and others sold at low price; hence, any new handbook must be good to sell. Savage's effort is worth while and the publishers are offering a handy, practical field reference. It is flexible and the over-all size, 5x7¼ inches, photographs of physiographic and geologic occurrences; specimens, and testing equipment, and sketches of placer deposits, rocker, pestle and mortars, claims, surveys, and mine workings simplify the text thereon. Many calculations are shown on how to estimate the gold in claims, specific gravity of minerals and sampling and evaluating prospects. Simple tests are given and shown, also definitions. Surveying, use of explosives, mining law, panning, retorting, first aid and a good index are other features of this graduate of Colorado School of Mines, now in California.

PERSONALS

W. J. Jenkins, President, Consolidated Coal Company of St. Louis, Mo., was in Washington, in September.

Tasker L. Oddie, former senator from Nevada and president of the Gold Mining Association, has been designated by RFC Chairman Jesse H. Jones to represent the RFC on questions of loans to mines.

Stephen L. Brown has returned to the Miami Copper Company, Miami, Arizona. He was formerly connected with the Piute Mining Company at Cantil, California.

W. Val DeCamp, Vice President and General Manager of the Cardinal Gold Mining Company at Bishop, California, has been appointed vice president and general manager of the Anglo-American Mining Company, which owns and operates the Yellow Aster at Randsburg.

T. J. O'Brien, President, Kemmerer Coal Company, Salt Lake City, Utah, was elected president of the Southern Wyoming Coal Operators' Association, at its recent annual meeting in Rock Springs. Other officers appointed were, vice president, **Forest Richardson**, president, Sheridan Coal Company, Omaha, Nebraska; treasurer, **V. J. Facinelli**, Rock Springs Fuel Company, Rock Springs, and secretary, **L. W. Mitchell**, Rock Springs (re-elected).

Edward Griffith, Kingston, Pa., for the past three years general superintendent of the Glen Alden Coal Co., has been elected vice president and general manager, effective September 1. Mr. Griffith succeeds the late S. D. Dimmick.

W. Y. Wildman, traffic manager, Illinois Coal Traffic Bureau, has been appointed managing director of the Illinois Coal Bureau, succeeding B. R. Gebhart. Mr. Wildman retains his position with the Traffic Bureau.

L. C. Ilsley, of the Pittsburgh Experiment Station, U. S. Bureau of Mines, has been appointed chairman of the Committee on Applications to Mining Work of the American Institute of Electrical Engineers.

H. C. Jackson, Pickands, Mather & Company, Cleveland, Ohio, was in Washington in September on tax matters.

At the recent annual meeting of the Alabama Mining Institute the following were elected to the board of directors: **H. T. DeBardeleben**, president, DeBardeleben Coal Corp.; **Herbert Tutwiler**, president, Black Creek Coal and Coke Co.; **D. A. Thomas**, president, Montevallo Coal Mining Co.; **A. B. Aldridge**, president, Southeastern Fuel Co.; **G. F. Peter**, president, Southern Coal and Coke Co.; **A. R. Long**, president, Brookside-Pratt Mining Co.; **Harold McDermott**, vice president, New Castle Coal Company; **Hugh Morrow**, president, Sloss-Sheffield Steel & Iron Co., and **Wade H. Oldham**, vice president, Republic Steel Corporation.

Dr. R. C. Allen, vice president, Oglebay, Norton & Company, Cleveland, Ohio, was a visitor in Washington during the past month.

K. M. Simpson has been reappointed as Administration member of the iron and steel industry's Code Authority.

W. E. E. Koepler, secretary of the Pocahontas Coal Operators' Association, has been elected first vice president of the Smoke Prevention Association of America.

A. J. Seligman, president of the Butte Copper & Zinc Co., and **W. B. Daly**, manager of mines for the Anaconda Copper Mining Co., have been appointed members of the Code Authority for the manganese industry.

Roy P. Hudson has resigned as chemist with the Elk Horn Coal Corp., and will enter consulting work.

Harry L. Day, president, Hercules Mining Company, was in Washington in September.

William Goodman, vice president, Goodman Manufacturing Company, Chicago, Ill., was a visitor at the offices of The American Mining Congress during September.

James H. McGraw, chairman of the board of the McGraw-Hill Publishing Company, has been appointed a member of the Advisory Committee of the American Standards Association.

Marshall Haney, mining engineer of Geer, Va., recently completed a "look-see" trip over the gold-mining area of the Appalachian Gold Belt in Virginia, North Carolina, South Carolina, Georgia and Alabama. He visited practically all of the prospects and mines in operation, spending thirty days time and traveling over 4,000 miles.

A. D. Carlton, Cleveland Cliffs Iron Company, was a recent Washington visitor.

G. M. Humphries, president, M. A. Hanna Company, was recently elected a director of Industrial Rayon, Inc.

J. C. Redmond, a graduate of George Washington University, has joined the staff at Battelle Memorial Institute, Columbus, Ohio, and will be assistant analytical chemist. Mr. Redmond has been with the Bureau of Standards.

OBITUARY

C. A. Griffith, vice president and general manager, Pruden Coal and Coke Co., Knoxville, Tenn., died August 13 of injuries incurred when struck by a falling beam at the new preparation plant now under construction at the Pruden mines.

Mr. Griffith was known to his many friends throughout the coal fields for his achievements in designing equipment and improving coal mining methods. He will be remembered for the very active part he has taken at the Annual Coal Conventions of the American Mining Congress and his passing will be a distinct loss to the mining industry.

C. A. Griffith

George L. Nye, prominent Denver attorney, who was known to many mining men, died recently at his home, following a heart attack which culminated a three-months illness.

Mr. Nye was born in De Witt, Iowa, Aug. 3, 1869, of pioneer parents. He received his education in the public schools and the University of Michigan, from which he was graduated with the degree of bachelor of laws in 1891.

Confident that a youth's best chance to realize ambition was in the west, Nye went in 1896 to Utah, where he became assistant county attorney of Salt Lake County and city attorney for Salt Lake City in 1902-1903.

In 1905 he came to Denver. He was identified with much important civil litigation, and as a member of the Chamber of Commerce and as chairman two years of the Community Chest campaigns he took a deep interest in the social, business and philanthropic activities of the community.

HAVE YOU HEARD?

ADMINISTRATOR MOFFATT, head of the Administration's great Housing project, is said to be experiencing great difficulty in finding high-calibred executives who will make the necessary salary sacrifice to administer the program. "Honor and Glory" is said to be wearing thin in this effort to get important men to assume responsibilities at salaries around $5,000. It is said that the drafting of big-calibre executives is now being considered.

AS A PART of the Housing project, the Administration is taking a census to show living conditions. Information being gathered will show data on types of material used in construction, facilities for lighting, heating, and cooking. Conditions surveyed in 64 cities indicate only 30 percent of structures in good condition.

PRESIDENT AND HIGH ADMINISTRATION officials are said to now definitely sympathize with the plans of "labor sympathizers" in both Houses of Congress for social and labor legislation.

LIQUOR AND BEER TAXES for fiscal year ended June 30 brought $258,911,332, compared with $43,179,822 for previous year.

OIL ADMINISTRATION announced intention of making use of new law permitting assessment of $10,000 fine and 10-year prison term for persons making false statements in connection with oil production.

APPALACHIAN COALS, INC., has condemned the allocation plan suggested by the NRA Administrator, on the ground that it tends to eliminate free competition. They passed a resolution firmly condemning any plan with allocation of tonnage as its aim.

UNDER THE NATIONAL RECOVERY PLAN, 489 Codes of Fair Competition have been approved to July 31, 1934.

ACCORDING TO INFORMATION current in Washington, the future of the tariff bargaining proposal will be limited (at the present time) to reciprocal trade agreements with Cuba, following which nothing much is anticipated from the Commission until after the November elections. *New York Times* says reasons appear to be difference of opinion between tariff experts, unforeseen complications with foreign countries, and uncertainty of political consequences of revising tariffs downward before business improves.

CIVIL SERVICE DEPARTMENT estimates New Deal policies have now added more than 100,000 employes to Government payroll. There were 661,094 persons employed in executive branches of Government on June 30, 1934.

NATIONAL LABOR BOARD has redesigned itself to speed action. Regional boards are reduced from 20 based on cities to 18 based on districts embracing states or parts of states. Instead of volunteer unpaid chairmen, each board has a paid director with subordinates. The mediation and judicial functions of the board will be separate to avoid confusion.

PRESIDENT ROOSEVELT has announced that he will call a conference of leading industrialists to discuss plans for decentralization of industry. He advocates transfer of many factory units from urban to semirural sites.

CARNEGIE STEEL COMPANY has ordered a $10,000,000 continuous strip mill to be built at MacDonald works in the Youngstown district.

THE U. S. STEEL CORPORATION reports larger earnings for the quarter ending June 30, 1934, than for any corresponding period since 1930—$21,082,389, compared with $6,578,731 in the preceding quarter. Payrolls for the quarter amounted to $65,094,000, compared with $33,468,000 for the same period in 1933. General Motors' total world sales for the first six months of this year increased 50.5 percent over the same period last year. One hundred and fifty-eight industrial corporations reporting earnings for the first half of 1934 show a profit jump of 85 percent over this period last year. Business failures for the year to date have declined by about 50 percent from last year's corresponding total.

J. D. A. MORROW, president of the Pittsburgh Coal Company, credits NRA with the revival of optimism in the coal mining business. "Only a year ago," he told several hundred operators at a recent luncheon, "the coal industry was demoralized by competitive prices. Operators were not selling coal. They were selling the wages of their miners. Now nearly all operators are endeavoring to find methods of increasing cooperation to benefit the entire industry," and "the New Deal seems to be only beginning."

INTERNATIONAL MINE, Mill and Smelterworkers' Union claim to have almost doubled membership of 25,000 in past year, large majority of which belong to left wing.

TREASURY FIGURES show that between July 1 and 25 the Treasury spent $244,293,998 more than it took in. Government ended first month of fiscal year with deficit of $248,685,105, as compared with deficit of $107,757,140 on July 31, 1933.

AMERICAN FEDERATION of Labor estimates the number of unemployed in the United States in June as 8,499,000.

AMERICAN FEDERATION of Labor also announces that organized labor is preparing to fight to defeat President's unemployment insurance and old age pension plans.

ABOUT SEVEN THOUSAND union workers in the Detroit plant of the Hudson Motor Car Company have quit their affiliation with the American Federation of Labor and are joining an independent association exclusively for automobile workers.

THE ALUMINUM COMPANY of America has rejected the proposed closed-shop agreement submitted by the Aluminum Workers' Union.

L. P. ZIMMERMAN, deputy administrator of the Minnesota Emergency Relief Administration, reports that more than 500,000 persons, or 20 percent of the population of the state, are on relief rolls.

PRESIDENT ROOSEVELT declares that "stealing" of public domain is finished; that country has entered upon "an era of building, the best kind of building, the building of great projects for the benefit of the public and with the definite objective of building for human happiness."

AMERICAN FEDERATION OF LABOR warns that unless private industry moves rapidly in reemployment of the millions now idle, that "society may be compelled to take over the means of production." William Green says that if industrialists shall confess their inability to guide nation's economic destiny, labor will consider means of supplying the people with all essentials.

NEW YORK BOARD OF TRADE says that unemployment insurance is unsound, but advocates "unemployment reserves" properly administered by employers and contributed to by both employe and employer.

FELIX WARBURG urges young men with a leaning toward investment banking to get Government jobs, declaring that opportunities in this field are broader in the Government today than in the investment field.

NEWS OF MANUFACTURERS

FROM THE STANDPOINT of sales, two new developments of the Sullivan Machinery Company of Chicago have an important significance. Both of the new items—Sullivan Airdox and the Sullivan Coal Saw—bring down the coal at the face without explosives and eliminate the shattering that results in continuous degradation in handling.

The Sullivan Coal Saw, designed by J. F. Joy, is a flexible and mobile unit that can operate in seams as low as 36 in. This saw first cuts thin, deep slots at the roof and floor of the seam and then cuts thin vertical slots to form solid blocks of coal of predetermined size. Slate bands and other impurities may be sawed out at the same time the coal is blocked out. The blocks are quickly and easily dislodged by the Sullivan Hydraulic Breaker Pad, which is simply a fabric reinforced rubber bag inflated with hydraulic pressure after insertion in the sawed slots. The pressures developed are sufficient to dislodge the solid blocks from the face and reduce the coal to convenient loading sizes.

Sullivan Airdox replaces explosives with a controllable compressed-air cartridge that pushes out the coal. The cartridge is placed in the conventional way in the conventional blast hole and the present mining method is not altered.

"THE WORLD'S Most Popular Pneumatic Tools" is the title of a new eight-page bulletin (2037-A) recently issued by Ingersoll-Rand Company, 11 Broadway, New York, N. Y. The bulletin lists for the first time the company's new sizes of "Multi-Vane" drills and "Multi-Vane" push-throttle screw drivers and nut setters. It also illustrates and gives size-and-capacity tables of the I-R pneumatic drills, grinders, riveters, chippers, rammers, wrenches, hoists, etc. A copy of the new bulletin may be obtained by writing the above address; or from any I-R branch office.

THE JEFFREY MANUFACTURING COMPANY announces the appointment of Alphonse F. Brosky as special engineer attached to its general offices at Columbus, Ohio. To accept this new post Mr. Brosky has resigned as consulting editor of *Coal Age*, on the staff of which publication he had served in various editorial capacities from 1921 until the past winter when he acted as assistant fuel advisor to the Federal Surplus Relief Corporation in Washington.

ENGINEERS from far and near—consultants, mining operators, and technical editors—gathered at Westport, Conn., on Tuesday, July 17, to do honor to Mr. John Van Nostrand Dorr, whose laboratory and experimental plant is located in Westport, and to commemorate the thirtieth anniversary of the invention of the Dorr Classifier, which was the first of a long line of inventions upon which his company's international engineering business is based. The events of the day consisted of a picnic at the Westport Mill, laboratory of the Dorr Company, attended by about 175 persons; a golf tournament in the afternoon at the Long Shore Country Club, where 25 competed for a prize offered by Mr. Dorr; and a testimonial dinner in the evening at the Red Barn, on Wilton Road, attended by a small group of 50 senior members of the Dorr staff and old friends of Mr. Dorr's who were associated with him in the early gold-mining days at the turn of the century.

The feature of the ceremonies on Tuesday at the Westport Mill was the christening, by Mr. Dorr, of a scale model of his first Dorr Classifier of 30 years ago, built in Westport by Wilbur Johnson, who was born in the Black Hills of South Dakota and whose father, A. E. Johnson, also of Westport, worked with Mr. Dorr at the Lundberg, Dorr & Wilson mill and helped to build the original machine. Another member of the Dorr staff recently visited the site of the original invention at Terry, S. Dak., and brought back to Westport for display some of the original parts of the first machine.

THE PUBLICATION of a new eight-page illustrated booklet entitled "101 Uses for the Air Acetylene Flame," has just been announced by the Linde Air Products Company, 30 East Forty-second Street, New York, N. Y. The field of this pamphlet is so large and the subject is treated in such a comprehensive manner that every repair shop will welcome it eagerly as a handy reference guide.

Copies will gladly be furnished upon request. Address the Linde Air Products Company, 30 East Forty-second Street, New York, N. Y.

A NEW 32-page illustrated catalog No. 1415, with horsepower and other engineering data, dimension diagrams, etc., has recently been issued by Link-Belt Company, Philadelphia, Chicago, San Francisco, from whom a copy may be obtained by request made on business letterhead. The book covers single, double and triple reduction units of herringbone gear type; also a full line of flexible couplings.

A NEW 80-page reference book on "How to Select Insulated Cable" has been published by the General Electric Company. Designated as GEA-1837, the publication covers cable for the transmission and distribution of electric power at normal frequencies, and presents in convenient form the information that is required in determining the cable best adapted for a particular installation.

A BULLETIN of decidedly original design and make-up, on "A Better Portable Compressor," has just been issued by Ingersoll-Rand. It sets forth in a novel and interesting manner the many advantages of the company's Two-Stage, Air-Cooled Portable Compressor.

This unit is built in five sizes, ranging from 75 to 370 cfm. piston displacement. It is supplied in a large variety of mountings—from a steel-wheel mounting, with a towing speed of 10 mph., to the two-wheel trailer mounting, which can be towed by a truck at 35 mph.

STEPHENS-ADAMSON MFG. CO., conveyor manufacturers of Aurora, Ill., have just published a 16-page catalogue describing their Redler conveyor-elevator—a new and unique method of conveying bulk materials horizontally, vertically, up inclines, and even around curves.

The Redler conveyor consists of an enclosed steel trough, through which is pulled a light skeleton conveying element that causes the material to flow in a solid, tranquil column wherever the trough leads. The conveyor will feed itself a full load from bins or hoppers and can be discharged at any point by opening slide gates in the casing and allowing the material to fall gently away from the conveying element.

The new Redler catalogue gives details, sizes, capacities, and shows these conveyor-elevators handling coal, grains, malt, flour, starch, salt and even face powder.

JAMES H. PIERCE & COMPANY
ENGINEERS AND MINE MANAGERS
A successful background in the practical solution of difficult engineering and managerial problems.
Reports—Valuations—Appraisals—Cost Analysis
Scranton Electric Building, Scranton, Pa.
Whitehall Building, New York, N. Y.

PETER F. LOFTUS
Consulting Engineers
ENGINEERING AND ECONOMIC SURVEYS. ANALYSES AND REPORTS ON POWER APPLICATIONS AND POWER COST PROBLEMS OF THE COAL MINING INDUSTRY
Oliver Building Pittsburgh, Pa.

M. C. LAKE
Consulting Geologist and Mining Engineer
Appraisals, Examinations, Explorations
1300 Leader Bldg. Cleveland, Ohio
909 Fidelity Bldg. Duluth, Minn.

Are You a Member of The American Mining Congress?

1
1,000,000
of a SECOND

A millionth of a second is almost inconceivable. Yet the *Mettegang* recorder measures it accurately. Hercules uses this sensitive instrument (one of the few in this country) to check the rate of detonation of explosives. Precision measuring apparatus, such as the *Mettegang* recorder, helps to maintain the high standard of uniformity and reliability for which Hercules explosives are noted.

HERCULES POWDER COMPANY
INCORPORATED
934 King Street, Wilmington, Delaware
A-42-R

CORE DRILLING

Oldest core drilling contractors in the world. Over 50 years world wide experience. Modern equipment. Ample rigs for any size job—anywhere. Unusually high percentage of core recovery and accuracy of records. Expert service with speed at low cost.
SULLIVAN MACHINERY COMPANY
Offices in All Principal Cities
400 N. Michigan Avenue, Chicago, Ill., U. S. A.
SULLIVAN

DIAMOND CORE DRILLING
CONTRACTORS
We make Borings for Coal, Clays and all Minerals. Up-to-date Equipment. Gasolene, Steam and Electric Outfits. Ask us for estimates.
MOTT CORE DRILLING COMPANY
HUNTINGTON, W. VA.

We Look Into the Earth
By using Diamond Core Drills. We prospect Coal and Mineral Lands in any part of North or South America.
Pennsylvania Drilling Co.
Pittsburgh, Pa.
Drilling Contractors

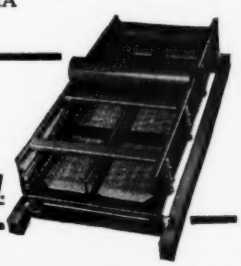
INDEX TO ADVERTISERS

American Brattice Cloth Co. 3
Bethlehem Steel Company 6-7
Chicago Perforating Co. 42
Hercules Powder Co. 42
Hoffman Bros. Drilling Co. 42
Lake, M. C. 41
Link-Belt Co. ..... Back Cover
Loftus, Peter F. 41
Mott Core Drilling Co. 42
National Carbon Co. 3
Pennsylvania Drilling Co. 42
Pierce & Co., Jas. H. 41
Roberts and Schaefer Co. 3
Robinson Ventilating Co. 42
Sullivan Machinery Co. 42
Universal Vibrating Screen Co. 42

PERFORATED METALS
of Every Description
MINING SCREENS OF ALL KINDS
CHICAGO PERFORATING CO.
2445 West 24th Place
Canal 1459
CHICAGO, ILLINOIS

ROBINSON
VENTILATING COMPANY
Fans and Blowers
Ventilating Engineering Service
ZELIENOPLE
PENNSYLVANIA

UNIVERSAL VIBRATING SCREENS
Popular the World Over—Highest in Efficiency. Lowest in Cost. Write for Catalog
UNIVERSAL VIBRATING SCREEN CO.
RACINE — WISCONSIN



O. C. Hoffman, Pres. Established 1902 L. H. Hoffman, Treas.
HOFFMAN BROS. DRILLING CO.
—CONTRACTORS—
DIAMOND CORE DRILLING
PUNXSUTAWNEY, PA.
Our specialty—Testing bituminous coal lands
Satisfactory cores guaranteed

The Bureau of Mines *and* YOU

The United States Bureau of Mines was established almost a quarter of a century ago to bring increased safety and efficiency to mining.

Now, because of severe cuts in funds, that Federal agency is being forced to curtail services and neglect duties assigned to it by law.

You, like every other person whose activities are linked with mining, have gained direct or indirect benefits through the Bureau of Mines.

The American Mining Congress is advancing a campaign to bring restoration of the Bureau of Mines to its proper place as a renderer of vital service.

This campaign must succeed if you and your fellow industrialists are to have future assurance of returns in service for the heavy taxes you pay.

Join now with the scores of mining men and equipment manufacturers who already have decided to lend their support to this special and vital effort.

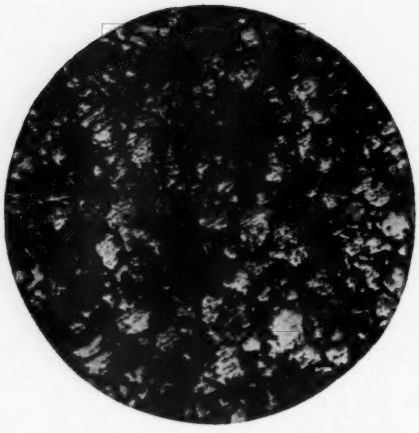
For further information address

THE AMERICAN MINING CONGRESS

MUNSEY BUILDING

WASHINGTON, D. C.

LINK-BELT
PROMAL
The Super-Service Cast
SPROCKET CHAIN



Cross section of Promal, the metal of advanced physical properties. Its merit is not a surface quality, but goes all the way through—the whole metal is PROMAL. The white areas represent soft metal. The black network structure indicates stronger, stiffer material, which acts as a reinforcement around the soft white portions, preventing their distortion under load, and so strengthening the material. Magnified 100 times.

PROMAL is an original Link-Belt development which has achieved a combination of high tensile strength and wear resistance never before equaled in cast chains. Over five years' service, in all industries under the most exacting conditions, has proved its worth. PROMAL possesses in a high degree all the qualities desirable in cast sprocket chain: great toughness, great ultimate strength, high yield point, high resistance to abrasive wear and to corrosion.

A Typical Experience with PROMAL

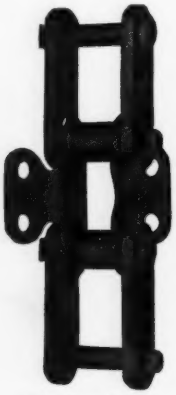
A Promal Chain is now used on a certain machine, in place of an ordinary malleable chain. The service is severe, and the trouble experienced was constant breaking of the malleable chain, and short life. Promal Chain is lasting twice as long.

You can now obtain PROMAL in all sizes of standard cast chains. PROMAL will operate on the same wheels as malleable chains of same number and dimensions.

LINK-BELT COMPANY 5101B

INDIANAPOLIS PHILADELPHIA CHICAGO SAN FRANCISCO TORONTO
Denver, Seattle, Pittsburgh, Wilkes-Barre, St. Louis, Huntington, W. Va., Kansas City, Mo.
Offices in Principal Cities

"1100" Class roller chain has sidebars cast with projections at one end which telescope, forming rigid barrel over which roller turns freely.



"C" Class chain is a combination of cast block links (malleable, Promal or cast steel) and outside bar-steel sidebars, connected by steel pins or rivets.

Original Ewart Detachable Link-Belt is the standard for conveyors, elevators and drives of moderate capacities and speeds.

Long pitch chains for engineering work: made with plain carbon steels, or special alloys, special heat treatments, etc., for varied conditions of service.

"SS" Class steel drive chains are made with offset or straight side bars; with or without rollers; to meet conditions requiring extra strength, ruggedness and durability.

Rivetless chain with F-2-F attachment. A drop forged steel chain for heavy duty conveyor and elevator service.

***Some Typical* LINK-BELT *Chains made in* PROMAL, Malleable and Steel**

h
A
el
y
a-